JULY 18, 1959
VOL. 157 — NO. 3

Telephony

THE JOURNAL OF THE
TELEPHONE INDUSTRY
SINCE 1901

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 500 S. Dearborn St., Chicago 5, Ill. Subscription $4.50 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

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"PIONEER BELLE," WINNER

Carlyn, daughter of Robert Johnson, office manager of Selah (Wash.) Telephone Co., statuesque in a sweeping gown with a parasol, depicted the "Pioneer Belle" in Selah community parade. The float, on a small car, won third prize in commercial division.

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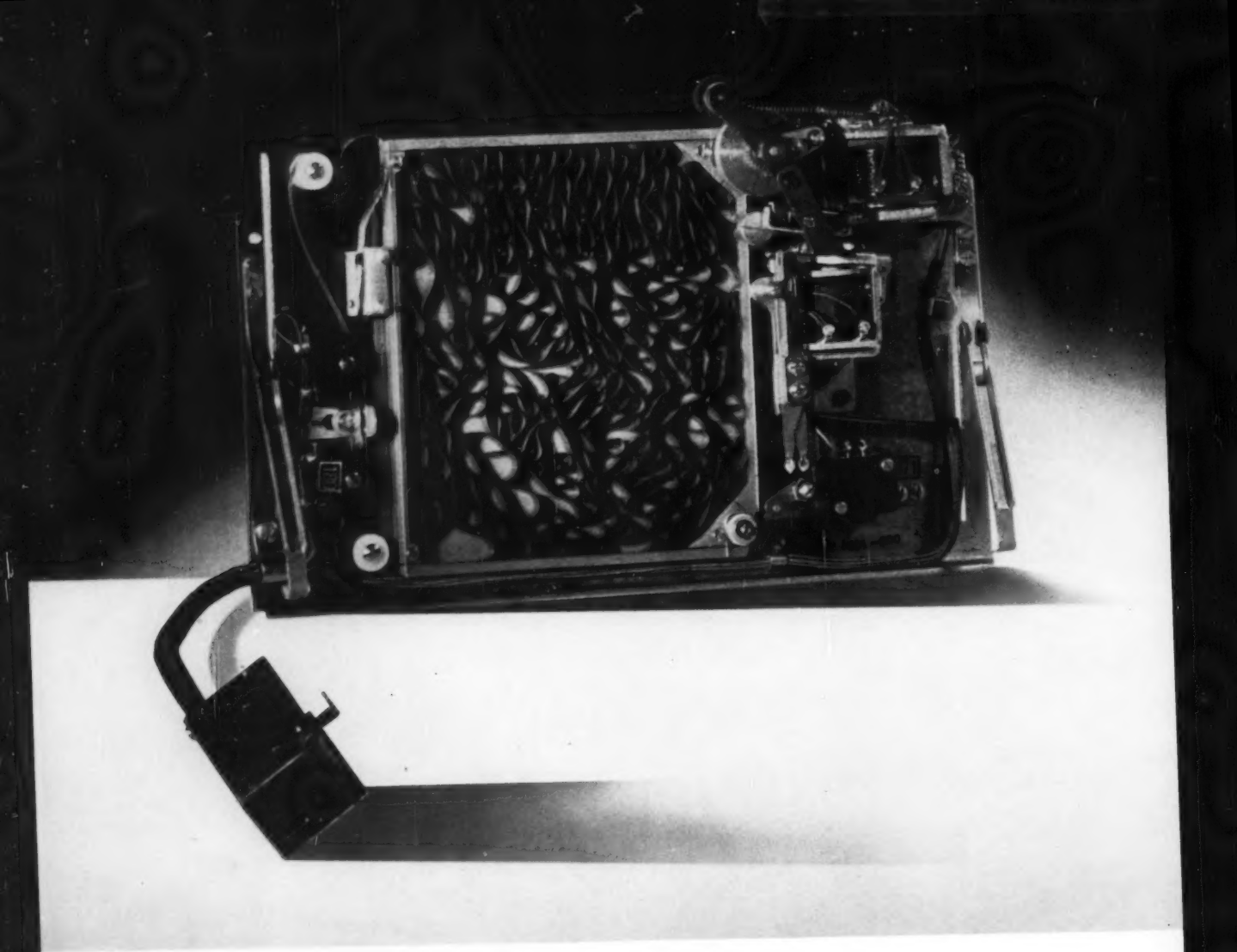

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FLASHES AND PLUGS

LONG STORY SHORTENED. "The New York Telephone Co. recently decided to drop the full names of New York City telephone exchanges. From now on, operators will say 'MU' instead of 'Murray Hill,' for example, and these abbreviated forms will also be used in the new directories.

"It is a move that will save a certain amount of confusion, but something of New York's history will vanish in the process.

"For the oldest exchanges still have names that are associated with their neighborhoods, as in MUrray Hill, BOwling Green, GRamercy, CHelsea, PLaza and quite a few others.

"Some exchanges are identified with early settlers, as in the case of ALgonquin—settlers don't get much earlier than that—or old families like the RHinelanders.

"Some have a social cachet of their own, the most famous example being BUtterfield 8, which John O'Hara used as the title for his novel on the gentry of the upper east side. Now the novel will have to be called 'BU 8.'

"In recent years, as the city has grown and needed new letter combinations, many of the old exchanges have yielded to such JOhnny-come-latelies as YUkon, LYceum, HIckory and TWining.

"YUkon 8, in fact, which savors more of sourdough than Chanel No. 5, now embraces one of New York's most posh residential sections.

"Thus old patterns shift as the telephone company stirs its alphabet soup, and a man is no longer known by the call letters he keeps."—*New York Herald Tribune.*

•

BARE ESSENTIALS. Boeing Aircraft Vice President Wellwood Beall came up recently with a forecast of the "ultimate" airliner.

He told a convention of the Aviation Writers Association that scientists eventually would reduce passengers to their "basic cells," send them over coaxial telephone cables and reassemble them at the other end.

"And I'll bet they'll still insist on two cocktails en route," he added.

•

IF A MAN ANSWERS, HANG UP! Windy Higgins may not be the first dummy ever listed in Illinois Bell Telephone Co.'s Chicago telephone directory, but he is the first genuine blockhead.

Windy informed newspaper reporters through his ventriloquist-owner, Paul Stadelman, who lives with him, that he is quite proud of his mention in the telephone book.

Getting himself listed in the telephone book is only one of many of Windy's achievements since he was cut from a tree.

He once got 143 write-in votes when he campaigned for governor of Kentucky.

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

JULY 18, 1959

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Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 30c per copy (except special issues—50c). Subscription $4.50, 1-year; $7.00, 2-years; $9.00, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

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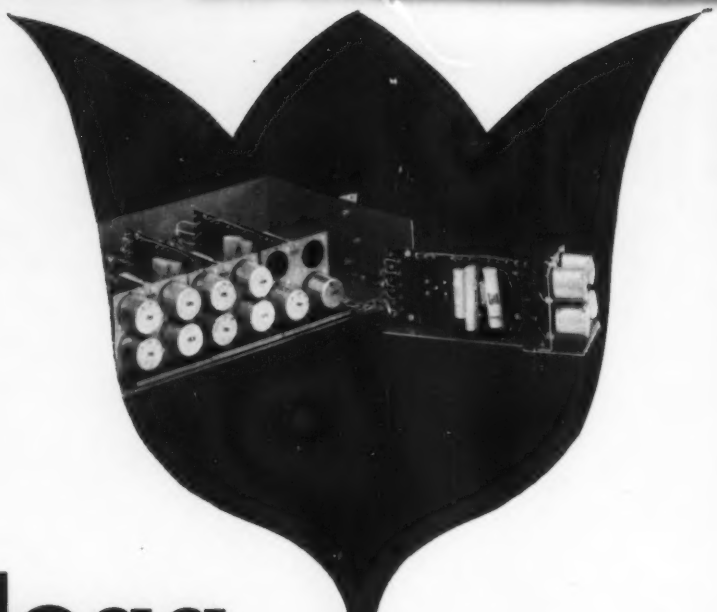

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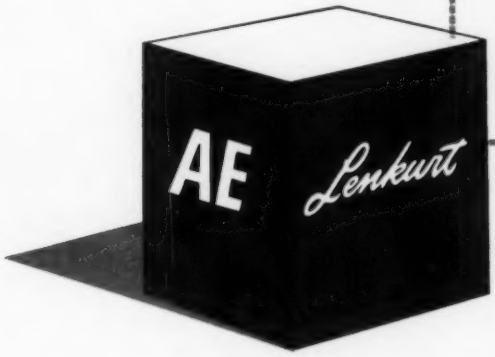

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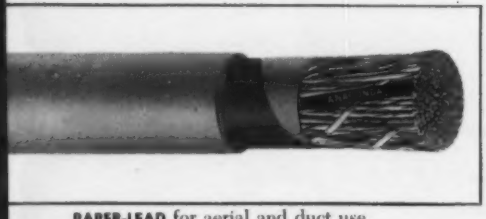

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No. 19 Awg	6 through	455	pairs
No. 22 Awg	11 "	909	"
No. 24 Awg	11 "	1515	"
No. 26 Awg	11 "	2121	"

The number in the assemblies denotes the number of pairs in the unit. The letters refer to the color of the outside pairs of the unit. GW, green-white; RW, red-white; BW, blue-white. The units are further distinguished by a color-coded binder string.

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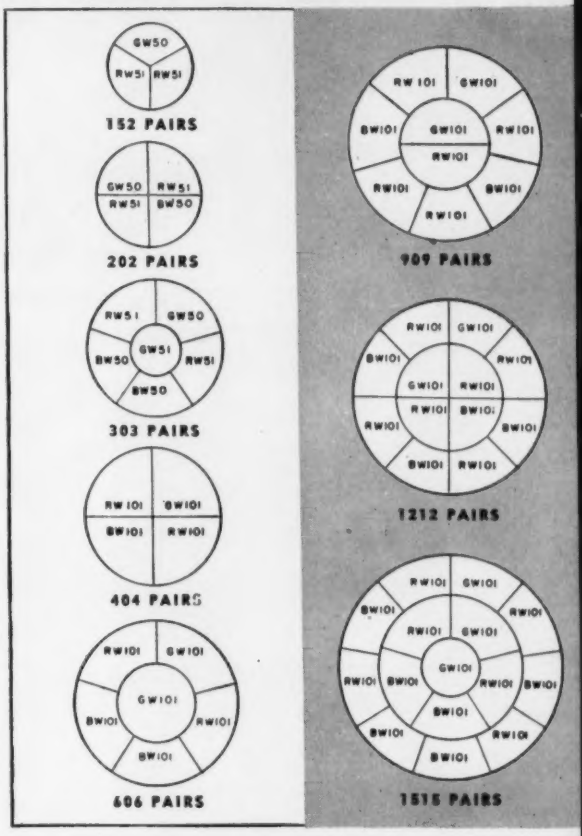

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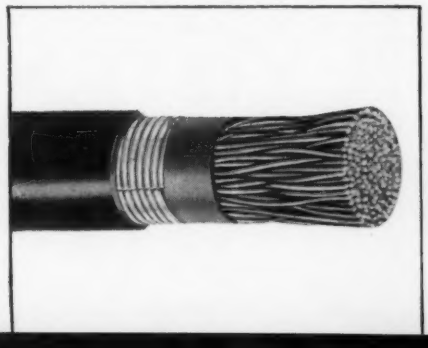
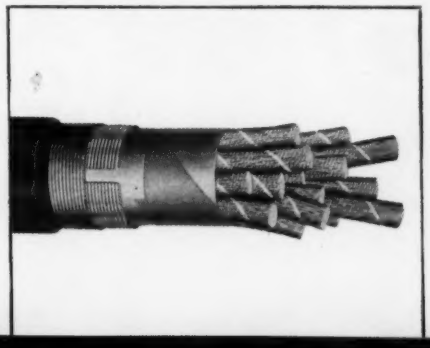


STALPETH—Paper-insulated, aluminum shield, steel tape, polyethylene jacket.



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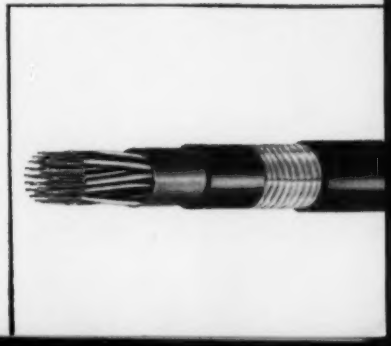

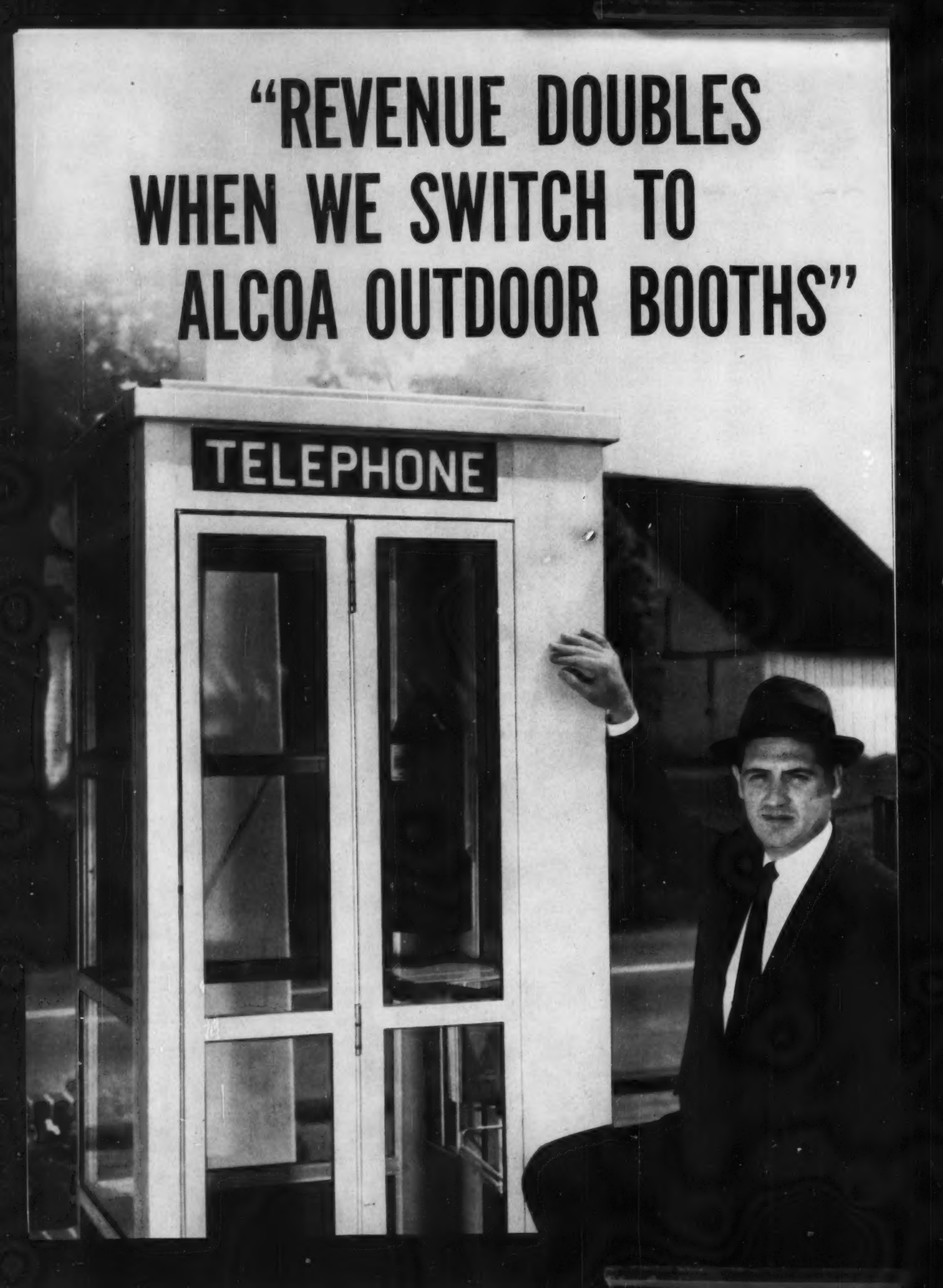
"REVENUE DOUBLES
WHEN WE SWITCH TO
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reports John E. Caldwell, of United Telephone Company of Pennsylvania

Thirteen Alcoa outdoor booths are popular stop-off points for both vacationers and residents at historic Gettysburg, Pa.

"In many cases where we have replaced indoor booths with outdoor booths of Alcoa® Aluminum, revenue has jumped 100 per cent or more," says Mr. John E. Caldwell, district manager at Gettysburg for United Telephone Company of Pennsylvania.

"Lots of people driving through this area obviously like to stop at these attractive, well-lighted booths to call ahead for reservations or call home. Local residents also make regular use of them. And we like them, too, because they are easy to erect and require only routine maintenance. With aluminum, no painting is ever necessary and cleaning is fast and simple."

United Telephone Company of Pennsylvania now has 120 Alcoa booths in its system. Like many other telephone companies throughout the country, they have discovered that outdoor booths of Alcoa Aluminum boost revenue and profits and gain immediate customer goodwill. Find out how Alcoa booths can do the same for you. Write for free brochure and ask your jobber to show you the Alcoa Goodwill Kit—the free promotional package that comes with every Alcoa booth. Aluminum Company of America, 1720-G Alcoa Building, Pittsburgh 19, Pennsylvania.

John E. Caldwell, district manager, United Telephone Company of Pennsylvania, shows why Alcoa outdoor booths are setting new revenue records in Gettysburg: a clean, bright appearance that stays that way—thanks to aluminum's inherent corrosion resistance and sturdy construction.

"Alcoa's compact construction gives maximum roominess in minimum space, keeps customers from feeling cramped while making a call."

"Continuous lighting in Alcoa booths gives a safe appearance that creates customer goodwill day and night," says Mr. Caldwell

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What is a Fair Rate of Return?

THE FIXING of rates which will yield a fair rate of return on invested capital during a period of economic inflation has very serious complications for telephone companies.

The issue is of vital importance for all companies, if they are to attract the necessary capital with which to expand and rehabilitate their plants to adequately meet the public's insistent demands for more and improved service. It is especially important for many small companies, if they are to stay in business.

One fact which is usually lost sight of, in the skirmish between capital, and labor, and consumers, in the fields of general competitive business, is the simple truth that rates of *regulated* business, such as the telephone business, have a tendency to lag behind general price trends in other lines.

The danger in this inherent tendency of telephone rates to lag so far behind general price trends is that telephone companies, themselves, and regulatory commissions, will get into a fixed attitude of accepting sluggish telephone rate trends as a matter of course. In other words, if telephone companies do not examine their own particular circumstances, and check *periodically* on their need for increased revenues, they can drift into a condition where serious harm can occur.

It can occur in the form of economic damage, undermining the credit position of telephone companies by not being able to invite equity capital into their enterprises, and their ability to go on functioning adequately in the public service.

One feature of this lag in telephone rates, compared with general price trends, frequently overlooked, is that it works both ways. When general prices go up, regulated telephone rates are slow to follow. And, when general prices go down, telephone rates are slow to follow, because they are not fixed in a free market, but under government regulation. It is necessary, in the case of a telephone company, to show actual operating experience, up or down, before a regulatory authority feels justified in granting it an upward adjustment in rates to reflect these operating costs.

Aside from this lag situation, there is another threat to sound economic operation of telephone companies in a period of rising prices. That is the tendency of many regulatory commissions to squeeze the allowable profit—that is to say, the rate of return on invested capital—to a minimum. This compels owners of telephone companies to absorb an increasing amount of operating costs, before they can get back even with the board.

A few basic and historical figures will tell the story of what has happened to the rate of return on invested capital of telephone companies quicker than any other argument.

During World War I, the average rate of return allowed telephone companies by courts and commissions in reported cases averaged slightly in excess of 7 per cent of the rate base. By 1922, which was during the period of *inflationary prices* following World War I, this average had risen to 8 per cent of the rate base. Then followed a period of slow decline in all telephone rate cases decided until, by 1930, when the depression really set in, the average allowed rate of return was slightly more than 7 per cent.

These average figures were derived from a study of 218 telephone rate cases decided from 1915 through 1929. In 66 of these cases, a rate of return of 8 per cent or better was allowed. And, in an additional 16 cases, a return of 9 per cent or better was allowed.

And, it should be kept in mind that the rate base generally allowed by the courts and commissions in those days was much more liberal than the strict and questionable "original cost—less depreciation" type of rate base, which some of our state commissions adopted after the Supreme Court decision in the Hope Natural Gas Case in 1944.

What happened to the average telephone company's allowable rate of return on invested capital when the 1930 depression set in? It drifted lower and lower, and so did general prices. By the year 1936, which is generally regarded as the bottom low-price year after the depression, in most rate cases, the rate of return allowed was 6 per cent.

As is well known, general prices commenced to rise after 1936, slowly at first and much more rapidly during World War II and the postwar years. But, did the rate of return on invested capital allowed in telephone rate cases also rise? *No, it went lower.* In 1946, the average return allowed was still around 6 per cent. But in 1947, the average rate of return in reported telephone rate cases drifted below 6 per cent.

And, today, after 12 years more of creeping inflation, some commissions still speak of a 6 per cent rate of return, or even less, as if that were a generous allowance (and in the case of small companies many times commissions have allowed a return much lower than 5 per cent). And, to repeat, today's rate of return is generally fixed on a rate base far more limited than the rate base commonly used in the old days of a higher rate of return.

Let's look at the differences between rate-base findings of commissions in the 20's and 30's and the rate base findings in recent years, especially since the Hope case decision.

In the old days, the rate-base valuation was sometimes fixed on the "reproduction cost" value of the telephone property, and sometimes on the "original cost" value. In most rate cases, especially where the company figures on "reproduction cost" value were considered high, and the commission staff's original cost figures were considered low, the commission arrived at a judgment figure somewhere between the two. This was the "old-fashioned" rate base and it usually worked out pretty liberal as compared with the strict "original cost—less depreciation" rate-base which some of our state commissions have followed in recent years.

We would venture to say that a 6 or 7 per cent rate of return on the so-called "old fashioned" rate base would work out, in the case of many telephone companies, to correspond with an 8 or 9 per cent rate of return on the restricted rate base.

The big question that arises, then, is, if commissions regarded a 7 per cent rate of return on the rate base of a telephone company as reasonable in 1929, why in the world are they talking about 6 per cent return, or even less, in 1959. They should be talking in terms of 8 per cent for all companies, especially for the smaller companies, and we think any *fair* economic analysis will bear out such a statement.

As we said at the outset, in the telephone industry, the percentage dollar income available for return on invested capital is most important. It is most important because it is the only means, under our system of free enterprise by which equity capital can be attracted to support and expand the operations of telephone facilities, so that they can keep step with public demand for telephone service.

How are telephone companies going to raise the money they need in the face of an historical picture of diminishing return to the investor, such as we have traced here? The answer is that they are going to have more difficulty in raising sufficient capital if the rate of return situation is not rectified.

It can be rectified if (1) telephone companies will ask enough of a rate increase, not only to keep their companies' heads above water, but also to attract the necessary equity capital to take care of needed plant expansion; and (2) if regulatory commissions will recognize the need for allowing a more liberal rate of return to telephone companies so the commissions, themselves, can meet their responsibility to the public in seeing that it gets the "best and most" telephone service.

After all, if the free enterprise system in this country is going to work at all, it has got to work fairly and squarely. We cannot persist in short-changing the investor without sooner or later injuring the public and the workers. Invested capital is certainly entitled to a reasonable rate of return. Our system has been often compared to a three-legged stool, with the investor, the consumer, and labor forming the three supports for the nation's economy as a whole. If we cut one leg short, the economy is not going to sit securely. If we keep on cutting off one leg, the whole set-up will eventually collapse.

To sum up, the diagnosis for the telephone industry boils down to a very short and homely truth: *It needs more money if it is to continue to provide the quality and quantity of service the public is and will be demanding.* It remains for the industry to ask for the money, and enough of it, and prove its case; and for the commissions to recognize the industry's needs and help it to explain the problem to the public.

The American people are such that they will not allow a major business, providing a vital service, such as telephone service, to deteriorate or become a casualty.

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

FCC approves examiners' opinion approving sale of two Wisconsin Independents—Menomonee Falls Telephone Co. and Lisbon Telephone Co.—to Wisconsin Telephone Co. (Bell).

AS FORECAST in this department several times, the Federal Communications Commission, as a whole, on July 6 confirmed, with little change, the initial opinion of two of its examiners in the controversial Menomonee Falls (Wis.) case. This was the case in which the United States Independent Telephone Association objected to the granting of a certificate to the Wisconsin Telephone Co. (a Bell System company) to acquire the Independent properties of the Menomonee Falls Telephone Co. and the Lisbon Telephone Corp. in suburban Milwaukee.

Unlike the examiners' decision, however, which included statements questioning the binding nature of the so-called Hall Memorandum of 1922 (whereby the Bell System voluntarily adopted a policy of avoiding the acquisition of Independent telephone properties, except in situations where local public sentiment or other special circumstances required such acquisitions in the public interest), the FCC decision ruled that the Menomonee Falls case had been handled by the Bell company within the spirit and terms of the Hall Memorandum.

The FCC's opinion stressed the poor quality of service and the inability of the Independent owner to improve it, plus the fact that no other firm offer to purchase the property had been made by any Independent company. The opinion brought out the Bell company's contention that it had actually made an earlier attempt in good faith to trade and failure to do so was not its fault. It was noted that other Independents could not bid because of the large capital outlay required. The FCC quoted as follows from the minutes of a USITA regional meeting in Wisconsin on Jan. 29, 1958, wherein it was stated:

"It was also agreed Bell's offer, being in excess of the rate base upon which the commission would permit a yield, made it practically impossible for an Independent to meet Bell's terms in its bid for the property.

"The Regional Committee concluded it was virtually helpless to counteract any acquisitions by Wisconsin Telephone Co. in the face of failure by USITA to get a policy statement from AT&T and the ability of Wisconsin Telephone Co. to outbid any prospective Independent purchasers."

Mention was also made of the local "hostility to Independents" engendered by the poor service performance of the Independent owners.

The FCC findings show that the General Telephone Co. (which made a tentative offer to the owner, which was not accepted) was ready, willing, and able to provide service improvements comparable to those envisioned by the Bell company. The opinion states:

". . . There is no doubt in this record that, from the standpoint of mechanical equipment, an Independent would be in as good a position to serve the public concerned as would Wisconsin. Menomonee — Lisbon, Wisconsin, and PSCW [Wisconsin Public Service Commission] urged in this connection, and it was found by the examiners that acquisition by Wisconsin [Bell] would furnish the quickest manner of solving the problem of furnishing first-class telephone service in this area on a satisfactory long-term basis, the reason, primarily, being that any attempt to follow the alternatives (inherent in throwing this matter back into the hands of . . . the Independents to work out a deal with consequent further regulatory proceedings) would be time-consuming with no certainty as to what could be accomplished, and in the meantime the service problem would continue with the public inconvenienced."

Both the FCC staff (Common Carriers Bureau) and the USITA took exception to this finding on grounds that the time consumed in regulatory proceedings was irrelevant as a basis for the FCC. The examiners thought otherwise, but the FCC as a whole worked this out on the basis that comparative performance (including the speed with which service improvements could be made) was really not an issue, in view of the fact that no Independent company had actually undertaken or proposed to make them. The opinion found on this:

". . . The record herein supports and we find that acquisition by Wisconsin [Bell] would furnish a sure and swift solution to the problem of furnishing first-class telephone service in this area on a satisfactory long-term basis. Inasmuch as this is not a comparative proceeding, there is no issue here as to which of the two companies could make the service improvements more quickly, and *we thus do not reach the question presented by the examiners' findings and exceptions thereto.* However, the community of interest of the person receiving telephone service in the Menomonee and Lisbon areas is with the Milwaukee metropolitan area, and it would be economical and efficient for the Menomonee and Lisbon properties to be connected with and integrated into the Milwaukee metropolitan area served by Wisconsin." (Italics supplied.)

Case-by-Case Approach

Of course, this aspect of the particular case cannot be divorced from the factual situation involved. Both the Wisconsin commission and the local area subscribers were naturally impressed by the fact that existing Bell System operations entirely surrounded the properties. And by the same token, another Independent company, however competent, might be

less enthusiastic about buying a small island in a large sea of Bell System operations and trying to make a go of it. The FCC found on this:

"The PSCW [Wisconsin Public Service Commission] position appears to be reasonable and it is found as a matter of fact that the integration of the Menomonee and Lisbon properties on the one hand and Wisconsin on the other hand would cause greater advantages to accrue to subscribers than would an acquisition of the properties by General. This is found to be the case notwithstanding this is not a comparative proceedings."

The FCC opinion states that it will follow a case-by-case approach in judging all such acquisition cases. In this case, for example, it was found that the Bell company had originally attempted to trade other properties with the Independent and had been unable to do so. The commission relied heavily on the Wisconsin Public Service Commission's view that the interest of the telephone-using public in the rapidly growing Milwaukee suburban area required improved modern telephone service which the Bell company was in a position to give without delay. The FCC agreed, in principle, with the USITA's contention that the state commission's position was not binding on the FCC. But, it held that the state commission's "on-the-scene knowledge" was entitled to great weight.

Then the FCC found as a matter of fact that the Wisconsin company's acquisition policies had not been "aggressive." It found "no evidence that any Bell policy with respect to the acquisition of Independent telephone properties jeopardizes the position of the Independent portion of the industry." Most of the acquisition cases were said to involve very small companies generally in financial distress.

But, this is the old story of the drop in the bucket. The change-over of these particular properties of themselves is not impressive from the standpoint of the comparative position of Bell and Independents. Yet, if you get enough drops you can fill the bucket. The FCC summary states on this:

". . . the applicant [Wisconsin Bell] contends, and it is so found herein, that the development of the Bell companies has been consistent with the general, overall, development of the telephone industry and that the expansion of the Bell companies, for a good many years in the past, has not exceeded the relative expansion of the Independent companies and has not effected an inconsistent loss (relatively) to the Independent companies. Regarding the question of AT&T's relationship to Western Electric, it is interesting to note that '. . . the only Independent company which it is claimed is interested in the properties in question, namely, General Telephone Company of Wisconsin, itself maintains a similar relationship with its source of equipment.'"

"GOT EVERYTHING NOW? KNIFE, PLIERS, TAPE, GROUP HOSPITALIZATION CARD?"

Position of the Independents

The FCC summary agreed with the USITA's contention that the Independents, originally electing to serve the less prosperous outlying areas, have been awaiting the harvest of outward business expansion from the central city areas generally served by the Bell System. The opinion says about this:

"USITA shows that in the last 10 or 12 years a definite change in the pattern of telephone service growth as between the metropolitan and suburban rural areas has taken place. With the population movement to the outlying and rural areas, traditionally served, in large measure, by the Independents, a demand for service closely integrated with the large city systems has been encountered. It is obvious, as pointed out by USITA, that these areas on the edges of the large cities are, businesswise, very attractive. The areas served by Menomonee and Lisbon have a subscriber potential of 40,000, almost 10 times the number of subscribers presently being served."

The Wisconsin Bell did make a persuasive point, according to the FCC opinion, with respect to the need for considering so-called "distress cases" apart from the general policy restriction implied in the Hall Memorandum. The FCC says about this:

". . . the applicant [Wisconsin Bell] also points out that the vast majority of Bell acquisitions are so-called distress cases. It states that there have been instances in which USITA has not opposed acquisitions by Bell, and that in many of them Bell companies were requested, or even ordered, to serve areas by state regulatory commissions. The applicant presents the further argument which finds favor herein, to wit: If the Bell companies knew that they would have to sell other desirable telephone properties elsewhere, in order to make acquisitions, such Bell companies would be extremely reluctant to buy distress properties. Such an obligation, the applicant argues, could only have the effect of denying or at least delaying adequate telephone service in the light of possible anti-trust complications—a situation which Congress intended to overcome by the enactment of Section 221(a) of the Communications Act. . . ."

Finally, there is the matter of Independent manufacturing. The FCC did not feel that the acquisition of the Menomonee-Lisbon properties would alter the relative position of Independent telephone manufacturers, as compared with Western Electric, any more than the position of Independent telephone company operations as com-

pared with Bell System operations would be altered. The opinion stated on this point:

"USITA also points out, which is not factually denied, that Independent manufacturers of telephone equipment have made what it calls landmark improvements in equipment, including the self-restoring switchboard drop, self-sorting heat coils, compact-type wall sets, the automatic desk set telephone, the automatic dial telephone system, subscriber automatic toll dialing and toll ticketing, and unattended dial offices. Because of Bell's almost exclusive use of Western Electric products, it is alleged that continued acquisition by Bell will jeopardize the position of the Independent telephone manufacturing industry. This, it is said, is another reason why the present acquisition would not be in the public interest. It is admitted by USITA that this particular acquisition would not have, *per se*, universal ill effects but, as a part of a general Bell policy of 'attrition' of the Independents with ultimate disaster to the Independent industry, the acquisition should be disapproved. In the disposition of this contention, on the basis of the present record, the effect of Wisconsin's use of Western Electric products on the Independent manufacturing industry should not be a determining factor, because here such a factor as possible injury to the Independent manufacturing industry is too remote and could not be a basis for denying to Menomonee and Lisbon the service which will be rendered by Wisconsin."

Where Does Decision Leave Independents?

This writer has quoted at length, but selectively, from the FCC decision in this case because he thinks it is of more than passing importance to both Bell and Independent companies in their future relations on acquisition cases. And, in this respect, what the FCC has actually said, rather than what this editor *thinks* it said, will be controlling. Hence, there is no substitute in the actual language of the FCC on the points covered. So, on this basis, excuse the long quotes this once.

All right, where does this leave us? What does the case finally mean? Answering the latter question first, this writer believes the last word has not been spoken on acquisition policy. Nor does he think that the last word will be spoken by the FCC. This is not to suggest that an appeal will be taken. It probably won't. The fact that a unanimous FCC confirmed the opinion of two examiners does not hold out much hope that an appellate court could take any different view.

But, the problem presented here is one that need not be settled by litigation. In fact, using hindsight, perhaps litigation was not the best way to approach even this one case, involving the Menomonee-Lisbon properties. Perhaps it was a poor test, considering all the circumstances of inferior service, dissatisfied subscribers, and the predominance of Bell operations in the service area.

But, there are other situations, in other places, involving acquisition problems which are still unsolved. Perhaps a better approach would be that suggested by TELEPHONY some months ago, of an over-all review of the guiding principles of Bell-Independent relations in the light of changing circumstances.

This is not to suggest that the Hall Memorandum as a policy foundation for such relations has become obsolete and unworkable. On the contrary, the Hall Memorandum has served well the purpose for which it was created over 37 years ago. The purpose of future negotiations would be to reach a common ground for refining and clarifying its application in the light of changing circumstances.

And, circumstances have been changing rapidly in recent years. As indicated above, the populations of our larger cities are rapidly exploding into suburban and fringe areas. There is a natural tendency for Bell System companies to expand their central city operations, so as to follow the trend. But, the Independents, which have for years occupied the outlying areas, now find themselves in occasional collision with these dynamic shifts of population and expanding service area trends. The problem, therefore, is not how to find a substitute or a replacement for the Hall Memorandum, but rather how to make it work a little better, by reviewing the ground rules and making adjustments where necessary.

Surely men of good will can do this around a table better, than in letting opposing counsel battle it out before a regulatory commission. This is another way of saying that the acquisition problem would seem to call for negotiation rather than litigation. And, maybe, that is the real lesson to be learned from the Menomonee Falls case.

New FCC Telephone Division Boss

The FCC has a new chief of its telephone division of the Common Carrier Bureau. He is Sydney L. O'Guin a career employe who first entered the commission's service in 1946. From 1950 to 1955, O'Guin was chief of the FCC Common Carrier Bureau's field office in Atlanta, Ga. He has also held the post of Chief of the telephone division's accounting and compliance branch. He has been chief of the FCC's Rates and Revenue Requirements Branch.

O'Guin is a native of Hohenwald, Tenn., and is a graduate (B.S.) of the University of Tennessee. He has been acting chief of the television division since last March.

Convention Calendar

1959

Association	*Date*	*City*	*Hotel*
Tennessee	Sept. 9 and 10	Nashville	Hermitage
Arkansas	Sept. 14 and 15	Hot Springs	Arlington
Michigan	Sept. 16 and 17	Grand Rapids	Pantlind
Rocky Mountain	Sept. 16, 17 and 18	Salt Lake City, Utah	Utah
New England	Sept. 21, 22 and 23	Bretton Woods, N.H.	Mt. Washington
West Virginia	Sept. 23 and 24	Davis	Blackwater Falls Lodge
Nevada	Sept. 23, 24, and 25	Elko	Stockmen's
North Carolina	Oct. 4, 5, 6 and 7	Pinehurst	Carolina
Alaska	Oct. 5, 6 and 7	Anchorage	Westward
USITA Annual Convention	Oct 11, 12, 13 and 14	Chicago	Conrad Hilton
South Carolina	Oct. 25, 26 and 27	Clemson	Clemson House
Virginia	Oct. 29 and 30	Roanoke	Roanoke
Alabama	Nov. 9 and 10	Birmingham	Thomas Jefferson
Georgia	Nov. 11 and 12	Atlanta	Dinkler-Plaza
Oklahoma	Nov. 18 and 19	Oklahoma City	Skirvin
Florida	Nov. 30 and Dec. 1	Jacksonville	Robert Meyer

*Joint Convention

Performance Appraisal by Calculation

By F. E. NORRIS

Appraisal studies make top management's part in selecting executives easier. A new technique offers a practical way to consider the individual apart from his circumstances and to appraise him fairly alongside those in more fortunate jobs.

"APPRAISAL By Calculation" is a long-time favorite of mine. It would be nice if I could say my interest originated from a deep insight in the science of management. But I can't. The truth of the matter is, I was forced to be interested—forced by the desire to correct apparent inequities.

We have, for many years, measured performance and made comparisons between our various divisions. It is my intention to talk about that experience no more than enough to show something better was needed.

Our old, historic procedures were good enough to measure trends *within* divisions. But, when we used the same procedures for *interdivision* measurements, we got some rather weird results. What was unfortunate was the time it took to recognize that the results were indeed "weird" and then the time it took to do something about it. But "do something" we did. Just a few years ago—not more than five—we developed procedures based upon new concepts. We cannot claim entire originality, nor do we contend they even approach perfection. But, of this you can be assured, they have done a whale of a job for us in terms of dollars-and-cents economy, in bringing top talent to light and bringing about a general uplifting of morale. We've removed a lot of the guess work from what we are doing. We also removed many inequities.

I'll explain *one* of our new procedures. It will establish the principle of the several others we use. First, though, let me give you a backdrop to which the application and thought of these procedures are set. There are nine points:

(1) The first one is this: My comments pertain only to the *operating telephone companies* of the General Telephone System as distinguished from its manufacturing.

(2) Next, the plan I shall discuss was motivated *in the first instance* by the aim to do an over-all more efficient job in dollars and cents. In other words, the appraisal of a man's worth to his company is an important by-product of our plans. The value of this "by-product" stems from the proposition that "worth" is measured by accomplishments. And accomplishments, in turn, are measured by the "plan."

(3) Our performance measurement plans cover a very substantial portion, but not all of our operations. We measure such diverse things as accounting, plant construction and switchboard operator work. I'll describe at some length, later on, one of these plans—*outside plant maintenance.*

(4) Another point is this: The plan to be described is not intended as a substitute for the personnel appraisal procedures and forms that the professional personnel people use. I am referring to the kind of forms filled out by colleagues and/or superiors which give expression about such things as job knowledge, ability to delegate authority, initiative, drive, appearance and so forth.

(5) Still another "background" point is that my plan is aimed at comparing performance between companies (or divisions) of a system such as ours, and, as well, between the subdivisions within a company. In other words, the plan under review, does not provide an absolute measure of performance of a single operation standing by itself.

(6) Continuing with "background" information we, under our procedures, are capable of measuring only a percentage of management employes—about 10 per cent. This is an important 10 per cent, however, because it is the uppermost echelon—the one from which top executives are normally selected. And, there are distinct possibilities of substantially increasing this percentage.

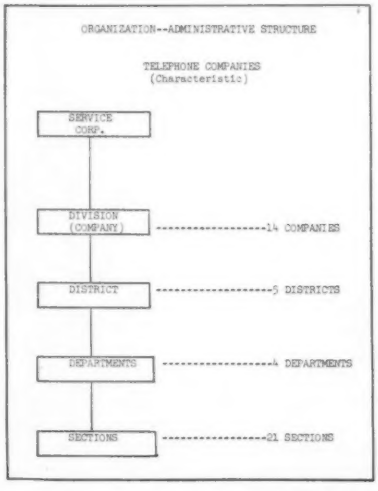
(7) The seventh point of background is that all that I have to say will refer to *quantitative* measurements. What I mean by this is illustrated by the question: How long does it take to do a specific item of work? It goes without saying, naturally, that quality of product or service is vitally important and must not be overlooked when quantitative results are discussed. We naturally do not overlook quality but we haven't time to get into that subject.

(8) Number eight is this: I mentioned that the plan to be discussed arose out of weaknesses in the comparison methods we'd been using. Of the various "yardsticks" used, these two were particularly popular:

One related performance to investment. This apparently was done on the theory that investment is a fair measure of size and that since certain performance volumes do have some relationship to size, an investment relationship is fair.

The second method related expenditures to the number of telephones served. The theory here apparently is that as a division's revenues are related to the number of telephones served, other performance, likewise, should be so related.

(9) The last of the preliminary points refers to the kind of an organizational setup to which our procedures apply, which is shown in *Chart 1* below.



*Mr. Norris is Vice President-Planning and Development of General Telephone & Electronics Corp. He presented this address at a recent General Management Conference of the American Management Association.

The Service Corporation shown in the upper box, designs and administers our measurement plans. It is located in New York.

Each District a Unit

Our performance plans are established in the 14 *major* companies or divisions of the system. They also apply to the few *minor* companies we have. From all our system companies we give telephone service in parts of 31 states.

Our divisions are generally divided into districts each of which is a distinctly separate administrative unit. In the multi-state divisions, all the property in a state may constitute a district. A particular state, however, may be divided into two or more districts. Texas, one of the five states served by General Telephone Co. of the Southwest, is so divided. It has six districts.

Each *district* has a complete operating organization of its own, consisting of four principal departments—Commercial, Traffic, Engineering and Plant.

These departments, in turn, consist of *sections* which are identified according to the kind of work they do. One department may consist of only three sections. Another may have as many as eight or nine. In all departments there are 21 sections.

Our "Appraisal By Calculation" procedures include only a portion of these 21 sections. The work of some sections, as far as our present views hold, is not susceptible to "calculated appraisal."

It will be helpful if I explain the "sections" of one department—and for that I'll talk about Plant.

It is characteristic of the Plant Department in each of our districts to be divided into the following sections:

Outside construction.
Outside maintenance.
Switchboard installation.
Switchboard maintenance.
Subscriber apparatus installation and maintenance.
Private switchboard installation and maintenance.
Motor vehicles.
Building and inventories.

Stimulates Competition

Various kinds of comparisons are made under our plans. For example, we compare results—

(1) Between districts within a division.
(2) Between divisions by major work classifications.
(3) Between divisions by the components of major work classifications.

While the number and kinds of possible comparisons that can be made is large, the ones actually made are limited to those which, we find by experience, lead to improved performance and which also stimulate wholesome competition in the forces.

Let us now move toward the figures of which I spoke. I'll use the simplest means I can to illustrate the principle with the hope of not becoming too involved. For this purpose, I shall, as mentioned a moment ago, talk about *one* plan—Plant Maintenance. Further, I shall limit myself to three of the more than 50 plant classifications in the plant maintenance category—poles, cable and bare wire.

There are two parts to our measurement program—each, oddly enough, is a complete plan in itself.

Both parts use a record of the *number of units* of each kind of plant being maintained and also the related record of *time* used to maintain them.

From this, by simple division, is determined the hours used per unit—say on a quarterly basis. We call this "measurement by *natural* units." It is a very valuable means of measuring performance. Its only weakness, if it can be called a weakness, lies in the fact that the different kinds of work in say a department, cannot be added together for purposes of measuring the department as a whole. This is illustrated in *Chart 2* above.

MAINTENANCE—COMPARISON

Hours Per NATURAL Unit

	Unit	*HOURS PER UNIT ACTUALLY USED* *Division A*	*Division B*
Poles	100 Poles	1.10	1.4
Cable	Sheath Mile	3.8	4.0
Wire	100 Wire Miles	13.30	10.50

Chart 2

This chart compares the performance of Divisions A and B for three kinds of plant—poles, cable and wire. The comparison in *each line* is in *natural units* as I just used the term. Notice that Division A excels in pole and cable maintenance, but is inferior in wire maintenance. When we look at these figures and ask the question: Which division is doing the better over-all job, we find ourselves playing a guessing game.

Equating Units

This leads to the second part of our procedures, the part which *equates* the number of units so that we can, in effect, add dissimilar things together. (See *Chart 3* below.)

This chart is self-explanatory except for the FACTORS. The number of units in the third column are from our records and the figures in the last column are merely the product of the number of units and the factors.

The factors themselves are the result of time studies—studies which were made under carefully observed conditions and for a representative period of time. These illustrative factors indicate, therefore, that during the *base period*, 1.5 hours were used to maintain the average 100 poles. Similarly, 4.6

MAINTENANCE—COMPARISON

Hours Per EQUATED Unit

	Unit	*Number of Units*	*Factor*	*Equated Units*
		Division A		
Poles	100 Poles	700	1.50	1,050
Cable	Sheath Mile	2,600	4.60	11,960
Wire	100 Wire Miles	1,200	14.50	17,400
TOTAL				30,410
		Division B		
Poles	100 Poles	2,500	1.50	3,750
Cable	Sheath Mile	6,500	4.60	29,900
Wire	100 Wire Miles	5,400	14.50	78,300
TOTAL				111,950

Chart 3

hours were used to maintain an average sheath mile of cable and 14.5 hours for 100 miles of wire. To make any sense, the same factors must, of course, be used in all divisions.

So that, in effect, what we have in the 30,410 and the 111,950 (total) figures are the equated units representing the total hours it *would have taken* to maintain the equivalent number of natural units shown in Column 3, had they been maintained during the study *base period.*

The important question is: How many hours *were currently used* to maintain these units in the respective divisions? When we compare the answer of this question with the *equated units* in the last column, we will have a result which weighs the fact that a division might be superior in one work category and inferior in another.

Let us see how this looks in *Chart 4* below.

By this procedure we are, in effect, expressing the total time used to maintain the sum of all kinds of units in terms of the *time* required to maintain the equivalent units during the *base* period. Thus, we have a *common denominator* by which comparative performance for *dissimilar* work can be measured—TIME.

Total Time Used

This leads to two rather interesting points. One is that we believe the *base period factors* need not be *dead accurate* in order to be of great value. Just what deviation might be tolerated before the effectiveness of the procedure will suffer, we've never tried to determine. We have accepted that a factor that might be plus or minus 5 per cent of dead accuracy will do an effective job. But, since we don't know what "*dead accuracy*" is, the discussion merely serves to illustrate the point that perfection isn't needed.

SUMMARY

	Current Actual Hours 1	*Equated Units* 2	*Index* 1 2
POLES			
Division A	**770**	**1,050**	**.73**
Division B	**3,500**	**3,750**	**.93**
CABLE			
Division A	**9,880**	**11,960**	**.83**
Division B	**26,000**	**29,900**	**.87**
WIRE			
Division A	**15,960**	**17,400**	**.92**
Division B	**56,700**	**78,300**	**.72**
TOTAL			
Division A	**26,610**	**30,410**	**.87**
Division B	**86,200**	**111,950**	**.77**

For an interpretation of the figures in *Chart* 4, let us look at the total for Division A in the "box" at the bottom. You will notice 26,610 hours were used to maintain the plant. This is for the *current* period to be measured. You will also notice that the same number of units of the same kind of plant would have required 30,410 hours during the *base* period.

It is fair to say, therefore, that *currently* Division A is using but 87 per cent of the hours used to maintain comparable plant during the *base period.*

Division B, however, used but 77 per cent of base period time.

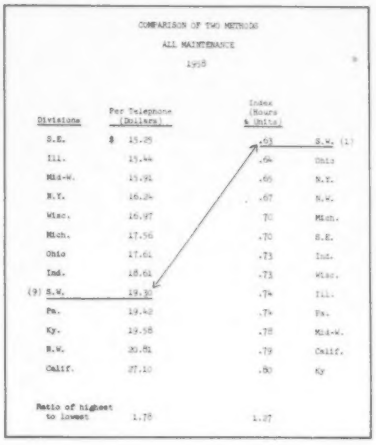
Thus, we can compare the *indexes* of .87 and .77 and conclude from them, that Division B is doing the better job by some 11.5 per cent.

This line of thought strongly supports a much more important point—one about which we are rather inflexible. This is our resistance to change a base study factor. We view them as being *permanent* and not to be changed to conform with current experiences. The tendencies of those being measured to change the factors are so strong and it is so important that they *not* be changed, that a few additional words are justified and yet, it is necessary to talk rather generally.

No "Norms" Used

We think that to set "norms," or "pars" or "standard times," which is what periodic changes suggest is, in effect, to assume that one knows what constitutes optimum efficiency. We hold we don't and can't know because we can't judge future inventiveness, techniques, ingenuity, etc. We believe that improved methods and improved tools and general progress flow from the competitive spirit and that this spirit is impaired if not destroyed, when "pars" are set. To adjust the factors or revise the "pars" from time to time, according to experience, changes the procedure from a measurement or appraisal plan to a *force adjustment* device.

The figures you've seen in the above charts are illustrative. Now I'd like to show you some actual results. (See *Chart 5* below.)


COMPARISON OF TWO METHODS
ALL MAINTENANCE
1938

Divisions	Per Telephone (Dollars)	Index (Hours & Units)	
S.E.	$ 15.25	.63	S.W. (1)
Ill.	15.44	.64	Ohio
Mid-W.	15.91	.65	N.Y.
N.Y.	16.24	.67	N.W.
Wisc.	16.97	.70	Mich.
Mich.	17.56	.70	S.E.
Ohio	17.61	.73	Ind.
Ind.	18.61	.73	Wisc.
(9) S.W.	19.30	.74	Ill.
Pa.	19.42	.75	Pa.
Ky.	19.58	.78	Mid-W.
N.W.	20.81	.79	Calif.
Calif.	27.10	.80	Ky
Ratio of highest to lowest	1.78	1.27	

You will recall I mentioned earlier two discredited performance measurement procedures. One related performance to investment and the other, the more popular one, to the number of telephones in service.

Column 2 shows the maintenance performance in dollars per telephone. Note that the Southwest Division ranks ninth. Now look over to Column 3. The figures in this column are the same kind we've been talking about—the kind that count how many things are being done, how long it takes to do them and relating these to base study experience. You will notice in this column that the Southwest Division ranks *first.*

I'll give you just one of several reasons why the per-telephone measurement is unfair to Southwest. That division has a very extensive long distance network which must be maintained and to which no *telephones* are directly related.

The equated unit plan reflected in Column 3 recognizes the amounts and kinds of long distance plant being maintained just as it recognizes the amount and kind of local calling plant. Any *fair plan* should do a thing like this, but the per-telephone comparison fails in this respect.

It is also interesting to note that the per-telephone results are more erratic than the equated unit or INDEX results. There are reasons why the per-telephone results fluctuate as they do and I shall not belabor the matter. It might be constructive, however, to illustrate the reason with one or two points.

Automation a Factor

There are charges to the maintenance accounts directly related to plant expansion. Thus, a plant in a rapidly growing area, all other things being equal, will have more maintenance charges than one in a less rapidly growing area. A good measurement plan will recognize a situation of this kind.

Automation is another consideration. It may be fine for a company, over-all, but creates maintenance expense to a greater extent than a corresponding manual operation. Again, this kind of thing must be recognized if a measurement plan is to do its job. The per-telephone comparison cannot give it recognition. The equated unit approach I've been describing *does* recognize things like this.

Now I'd like to tell you some of the reasons why we place such strong emphasis on *time* in our measurement procedures instead of upon dollars. But, first, be assured that we have great respect for the dollar. We have many dollar-type controls. And, we are particularly watchful of capital expenditures, rentals and contracts designed to save our time. But, by measuring performance in "time," with proper allowance for these things, we have been the most effective.

When we work with time *instead* of dollars, for interdivision comparisons, we avoid certain disturbing situations. You probably are aware of them but I'd like to mention a few.

One of the situations which disturbs dollar-and-cents comparisons between areas is the difference in labor rates. It is most difficult to equate these. The rates might differ because of contract pay levels. Or they might differ because of the length of time the average employe has been on the scale. And, of course, there might be a combination of the two.

Adjustments to Accounts

Then, there is the matter of adjustments to the accounts. Also, allocated charges and overtime costs may cast questions on the value of dollars-per-unit comparisons. Another thing, there are situations that sometimes arise from an increase or decrease in production demands for which an adjustment of forces cannot be immediately made—and this affects unit production costs.

These are perfectly normal situations. It is just that a report designed to show the true financial conditions of a company may not be the best tool that can be devised for all administrative controls. So, with no disrespect for dollars, I should like to return to the theme I've been discussing—that of measuring performance in terms of hours and work units. In this regard, there are a few points about application in which I think you'll be interested.

The first point is that the scheme I've been discussing *must be accepted* by the people to be judged by it. To get this acceptance there can be and need be no gimmicks. The plan must be eminently fair. If it is, it will be accepted as soon as it is understood. To attain this worthy goal we required a lot of preparatory work—so much, in fact, that it seemed we'd never get off the ground. Included in this were definite plans for keeping our people informed during its various stages of development. This gave them a sense of participation which proved valuable. It took us nearly *two years* before we got the kind of results we were after.

The "preparatory work" centered in two principal areas. One was in *definitions*. It is vital that every word we use means the same thing to everyone using it. This isn't altogether a question of semantics. It is more a matter of seeing the necessity for and the making of decisions of the meaning used in the procedures.

Another—and by far the most important item of "preparatory work"—lies in the area of accounting which I have mentioned briefly. We can arrive at a legally and professionally proper *end result* in accounting without giving the man doing the job the kind of data he needs to know in order to see what his real costs are. Special reporting procedures are needed to meet this problem. This is a big, complex problem about which nothing more than mention can be made now.

Uniform Reporting Essential

An indispensable part of this whole idea is *uniformity of reporting*. I make a point of "uniformity" for a very important reason. Once a way of *reporting* is decided upon, that "way" must be followed until it is changed *for everyone*. It may not be the best way, but unless everyone follows the same rules, comparability will be destroyed and with that the whole plan goes out the window. So, if anyone finds a better way to *report*, he must not change until everyone else measured by the plan also changes.

You will notice the emphasis of uniformity is on *reporting*. This is by way of making clear that I am not talking about uniformity in the way the actual job is done. I think you might agree if everyone did a given job the same way, with the same tools, etc., we would tend to stifle initiative and progress.

There is one more area of discussion. When persons are confronted with a new measurement plan they become apprehensive. Leaving out any discussion of the fear of those who have been "getting by"—there are competent people who honestly question whether any measurement plan can fairly recognize the conditions peculiar to their own operations. These people *must* be satisfied if the plan is to succeed—and they can be satisfied.

We found the fears can usually be allayed by rationalizing the situations that cause them. When a cause for apprehension exists, its existence is readily acknowledged but at the same time, it is brought into proper perspective. It is not unusual to find the existence of a peculiar local situation which, through conversation, can be made to seem so important as to destroy the worth of a plan but which, upon close analysis, proves of little or no consequence.

To illustrate these generalities, I'll talk about the maintenance of our now familiar open wire. In California we suffer the effects of corrosion from salt air. In Illinois and Indiana, it's sleet. In Texas, it's the long driving distances between headquarters and the exchanges. Then we have forested areas in Michigan, Spanish moss in the southeast—and I could name others.

In our rationalization we find this. That open wire, in total, constitutes less than 10 per cent of our plant. Of the total open wire we find only a percentage exposed to these "local" conditions. Next, we find that the "local" conditions are not a continuous cause of worry. Sleet storms, for example, occur only in winter and even then, not every winter. Then, too, we suggest that maybe there is something than can be done about worrisome local conditions. Finally, it is easy to admit that one division does not have all the "good" while another has all the "bad." In other words, there are offsets.

After such things as these are understood, the appraisal plans are accepted. More than that, I doubt whether you could take them away from our people now. For the first time they have a real incentive to do their best and to attack their problems, knowing they'll get recognition if they earn it.

Impact of Telephone Communication

On the Economies of the Various Geographic Regions of the U. S.

By ALEXANDER I. WARRINGTON*

Introduction

A SERIES of articles has already been published by TELEPHONY, particularly the following:

(1) "TELEPHONE GROWTH: Key to Expansion of Gulf and Florida Ports," TELEPHONY, Feb. 1, 1958, p. 24. Article deals with the role played by the telephone in the development of Gulf of Mexico and Florida ports.

(2) "TELEPHONE STATISTICS: The Nation's Economic Stethoscope," Jan. 3, 1959, page 23. Period from 1939 to 1956 covered and supported by detailed statistics for states and geographic areas.

(3) "TELEPHONE COMMUNICATION: Primary Agent in the Creation of Wealth and Income," Jan. 10, 1959, page 20. Explains how wealth and income are linked to the "time variable," particularly rapid communication.

(4) "THE TELEPHONE ERA BEGINS: And Large-Scale Manufacturing Becomes An Immediate Reality," Feb. 21, 1959, page 21. Deals with changes in the industrial economy at the turn of the Twentieth Century and is supported with detailed statistics for states and geographic areas.

(5) "TELEPHONE COMMUNICATION: An Agent in the Development of Foreign Trade," Feb. 28, 1959, page 19. Deals with the machinery of international trade and explains the importance of rapid communication. Supported by statistical tables, graphs and charts.

It is felt that these five articles were sufficient to bring about a better understanding of the strong relationships that exist between the development of telephone service and both (a) the general and economic progress, and (b) specific economic progress in the United States.

In concluding the above mentioned series with nine articles showing the impact of telephone communication on the economies of the various geographical regions of the U. S., it is assumed that the reader has some knowledge of the first five articles. This is mentioned because in the current regional articles, no effort will be made to duplicate the rather long statistical tables which supported the highly summarized narratives in articles (1) through (5). As to the reader who may be interested in the regional dissertations and who has not read the five articles cited above, anything which may appear to be incomplete in the regional articles will probably be clarified by referring back to the first five stories.

The series of articles depicting the impact of telephone communication on the economies of the various regions of the U. S. will be as folows:

Region I. The New England Economy.
Region II. The Mideast Economy.
Region III. The Great Lakes Economy.
Region IV. The Plains Economy.
Region V. The Southeast Economy.
Region VI. The Southwest Economy.
Region VII. The Rocky Mountain Economy.
Region VIII. The Far West Economy.
Region IX. Alaska and Hawaii. (Note: It is not possible at this time to present our newest states, but communication is now in progress with both Alaska and Hawaii and it is expected that in the early future this portion of the series will be presented in the detail which this region deserves.)

Note on Regional Economic Geography: An enormous amount of unorganized information has been developed appertaining to regional economic geography and regional industrial economics. However, organized treatment of these subjects is virtually non-existent. There is no serious problem of research because a stupendous amount of all types of analyses and investigations has been made. However, there is a problem of putting many pieces of research together in order to produce a composite regional picture. Therefore, the articles which begin in this issue represent at least an attempt to begin this important work. Regionalism is being recognized more and more as the proper beginning of planning in government, industry, commerce, and other fields.

A scratch on the finger may, for example, be treated with iodine; it certainly would be foolish and even dangerous to immerse the entire body in iodine; it would also be frightfully expensive. Conversely, cleanliness is not limited to a region of the body but must be extended to the entire person. And these crude examples illustrate the trend in regional thinking. (As a matter of fact, the federal government is already operating on a regional pattern, the states on a sub-regional pattern, and the larger industrial organizations are moving along similar lines.)

Note on Possibility of a Book: The author has been asked if there are any plans of revising this series of articles for inclusion in a book. Before steps are taken in that general direction comments are most ardently requested from the readers. Send comments to TELEPHONY stating why you think a book should be written and some of the things you would look for in such a publication.

*Mr. Warrington is an Industrial Economist of Baton Rouge, La.

Part I

Impact of Telephone Communication on Economy of Region 1. New England—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.

In 1956, the per capita income of the New England region was 2,202 dollars compared to the national average of 1,940 dollars. Since 1939, the increase in the per capita income was 212.7 per cent for New England, and 248.9 per cent for the Nation. The estimated population in 1956 for New England was 9.9 million, and in 1939 it was 8.4 million, and the growth was 17.8 per cent compared to the national growth of 27.2 per cent.

Households for New England in 1956 numbered 2.7 million, and in 1939 there were 2.2 million, or a growth of 25.4 per cent, while that of the nation was 37.9 per cent. The growth of households, in combination with population and per capita expansions, has not been on a par with the rest of the country, but there is no cause for alarm.

In 1956, there were 3.9 million telephones in the region and of this total 28.5 per cent were business telephones. This is very close to the national percentage which was 28.8 per cent for business telephones. In 1939, there were 1.6 million telephones in the region and the percentage of business telephones then was higher—33.8 per cent—and this compared closely with the national percentage of 35.4. The growth in total telephones for the period was 137.7 per cent for New England, and 188.9 per cent for the nation.

For the period from 1939 to 1956, manufacturing employment increased 130 per cent compared to 180 per cent for the nation. In keeping with the national trend of larger manufacturing enterprises with a decrease in number of units, there were 22.2 thousand manufacturing establishments in New England in 1900 and by 1939 this had decreased to 14.9 thousand. While a current count is not available, it has probably dropped to a lower figure.

Employment has gone up since 1900 when it began with 897.0 thousand; in 1939 it was 1,120.8 thousand and by 1956 it had reached 1,508.0 thousand. The rate of growth has not been as rapid as the national average. As to payrolls for New England, they were in millions of dollars: 420.7 in 1900; 1,401.8 in 1939; and 6,224.0 in 1956. These figures should be considered in relation to value added by manufacturing which were in millions of dollars: 756.0 in 1900; 2,413.6 in 1939; and 10,743.0 in 1956. It can readily be seen that salaries are significant and, rounding off the amounts, salaries in relation to value added by manufacturing become approximately as follows: 1900 to 1956, the curve for salaries is rising more sharply than the curve for value added by manufacturing until salaries go beyond 50 per cent of value added by manufacturing. Since the finished product must compete in the open market, it can readily be seen that problems in manufacturing arise.

In 1958, there were 4,141.9 thousand telephones in New England, of which 1,155.0 thousand were for business organizations and 2,988.9 thousand for residence use. Personal income in 1957 was 22,687 million dollars.

On the basis of persons engaged in various economic activities, the highest percentages were shown for the states indicated:

Total State Employment (1958)	*100.0 per cent*
Mining	Vermont
Contract construction	Rhode Island
Manufacturing	Connecticut
Transportation and other public utilities	Vermont
Trade	Massachusetts
Finance, insurance and real estate	Connecticut
Services and misc.	Vermont
Government	Maine

Note: In this and subsequent tables, the highest percentage concentration of employment, for type of industry within a state, are the states shown.

Maine

The per capita income in Maine in 1956 was 1,667 dollars and in 1939, 493 dollars. This was below the New England average. The per cent increase was 238.1.

The population in 1956 was 0.9 million and in 1939, 0.8 million, or a 6.8 increase which was below the New England average. There were 0.2 million households in 1956, or an increase of 16.8 per cent since 1939.

Telephones in millions were 0.2 in 1956, and this figure should be noted along with households. Business absorbed 26.9 per cent of all telephones in 1956, and 28.7 in 1939. From 1939 to 1956, total telephones increased 105.3 per cent which was below the New England average.

Manufacturing establishments increased in size but decreased in number. In 1900, there were 2.8 thousand establishments and by 1939 the number had shrunk to 1.1 thousand.

Number of employes has gone upward steadily from 73.0 thousand in 1900 to 82.1 thousand in 1939, to 111.0 thousand in 1956.

The relationship between (a) payrolls and (b) value added by manufacturing followed this pattern: 1956 (a) 389.0 million dollars and (b) 658.0 million dollars; 1939 (a) 83.4 million dollars and (b) 150.5 million dollars; 1900 (a) 28.7 million dollars and (b) 51.9 million dollars.

In 1958, the state had 280.8 thousand telephones of which 76.3 thousand were absorbed by business and 204.5 thousand by residences. The personal income in 1957 was 1,568.0 million dollars.

In 1958 the distribution of employment was as shown below:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	0.2
Contract construction	4.7
Manufacturing	38.9
Transportation and other public utilities	7.3
Trade	20.2
Finance, insurance and real estate	3.0
Service and misc.	9.9
Government	15.8

New Hampshire

In 1956, the per capita income of 1,812 dollars was under the New England average and in 1939 it was 559 dollars. The percentage increase was 224.1.

Estimated population in millions was 0.5 in 1956 and 0.4 in 1939, or a percentage increase of 13.2. Number of households in millions was 0.1 in 1956 and this was an increase of 23.1 per cent, slightly under the regional average.

Telephones in millions numbered 0.1 in 1956, and 26.1 per cent was absorbed by business, and in 1939 business accounted for 28.1 per cent of all telephones. The increase in telephones from 1939 to 1956 was 111.9, which was under the regional average.

Factory employment in thousands was as follows: 1956, 81.0; 1939, 61.2; 1900, 69.7. The relationship of (a) payrolls in millions of dollars to (b) value added by manufacturing in millions of dollars is as follows: 1956 (a) 283.0 (b) 495.0; 1939 (a) 65.1 (b) 104.1; 1900 (a) 28.0 (b) 47.4. In 1939, there were 0.7 thousand establishments and in 1900 1.7 thousand.

In 1958, there were 194.5 thousand telephones and 51.0 thousand were business telephones and 143.5 thousand were residence telephones.

Personal income in 1957 was 1,065.0 million dollars.

Employment in 1958 followed this pattern:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	0.1
Contract construction	4.8
Manufacturing	45.0
Transportation and other public utilities	5.6
Trade	18.3
Finance, insurance and real estate	3.4
Service and misc.	11.3
Government	11.5

Vermont

The per capita income in 1939 was 480 dollars and in 1956, 1,641 dollars, or an increase of 241.8 per cent. This was the lowest per capita income in the region, but the per cent increase was above that of New England and almost equal to the national average.

The population in 1956 was 0.3 million and this represented an increase of 5.2 per cent since 1939, which was considerably under the average for the region. To accommodate this population there were 0.1 million households in 1956, and this reflected an increase of 10.7 per cent since 1939.

There were 0.1 million telephones in the state in 1956 and this represented a gain of 88.9 per cent since 1939. In 1956 total telephones absorbed by business was 26.6 per cent and in 1939 the figure was 27.2 per cent.

In manufacturing, the number of establishments in 1939 was 0.6 thousand compared to 1.9 thousand in 1900. As to employment, it was 38.0 thousand in 1956 and 24.0 thousand in 1939. In 1900 total employment was 29.0 thousand.

(a) Payrolls and (b) value added by manufacturing, both expressed in millions of dollars, followed this pattern: 1956 (a) 144.0 (b) 248.0; 1939 (a) 27.4 (b) 49.7; 1900 (a) 13.0 (b) 25.1

Total telephones in 1958 in thousands was 118.1 with 31.8 for business and 86.3 for residences.

The personal income in 1957 was 626.0 million dollars.

Employment in 1958 followed the percentage distribution shown below:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	1.3
Contract construction	4.6
Manufacturing	35.0
Transportation and other public utilities	7.7
Trade	19.6
Finance, insurance and real estate	3.3
Service and misc.	13.1
Government	15.4

Massachusetts

Per capita income in 1956 was 2,206 dollars and this was above both the region and the nation. In 1939, the per capita income was 727 dollars and this was also higher than the region and the nation. The per cent increase was 203.4.

Population, in milions, was 5.0 in 1956 and 4.3 in 1939. The percentage gain was 16.1. Households, in millions, to take care of this population, were: 1956, 1.3; 1939, 1.1, a per cent increase of 21.1.

Telephones, in millions, were 2.9 in 1956 with 28.6 per cent absorbed by business, and 0.8 in 1939 with 27.2 per cent absorbed by business. The per cent increase from 1939 to 1956 was 124.1.

The number of manufacturing establishments in 1939 was 8.4 thousand and 10.9 thousand in 1900. Employment, in thousands, was: 1956, 714.0; 1939, 549.5; 1900, 463.4.

(a) Total payrolls compared with (b) value added by manufacturing, both expressed in millions of dollars, followed this pattern: 1956 (a) 2,904.0 (b) 4,884.0; 1939 (a) 702.4 (b) 1,181.0; 1900 (a) 224.7 (b) 408.9.

In 1958 there were, in thousands, telephones as follows: Total, 2,097.5—business 593.9; residence 1,503.6.

The personal income in 1957 was 11,361.0 million dollars, which was just about half of the entire personal income of the six New England states.

The distribution of employment, as of 1958, is shown in the concluding table:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	*
Contract construction	4.4
Manufacturing	37.6
Transportation and other public utilities	6.5
Trade	21.0
Finance, insurance and real estate	5.2
Service and misc.	12.6
Government	12.7

* None or less than 0.1.

Rhode Island

The per capita income was 2,012 dollars in 1956 and 713 dollars in 1939, or an increase of 181.6 per cent. This pattern was very similar to the region and superior to the national average.

(a) Population and (b) Households, both expressed in millions, presented this picture: 1956 (a) 0.8 (b) 0.2; 1939 (a) 0.7 (b) 0.1. The percentage increases were: (a) 18.5 and (b) 27.6. Telephones, also in millions, numbered 0.3 in 1956 and 0.1 in 1939, which showed an increase of 145.7, and this was above the regional average. Business absorbed 27.8 per cent of total telephones in 1956 and 35.8 per cent in 1939.

Manufacturing plants in thousands decreased from 1.6 in 1900 to 1.3 in 1939. Employment, in thousands, was as follows: 1956, 129.0; 1939, 122.6; 1900, 92.2.

(a) Payrolls and (b) value added by manufacturing, both in millions of dollars, followed this pattern: 1956 (a) 474.0 (b) 803.0; 1939 (a) 141.2 (b) 237.6; 1900 (a) 41.2 (b) 77.5.

In 1958 there were 312.1 thousand telephones with 85.3 thousand for business and 226.8 thousand for residences.

In 1957 the personal income was 1,715 million dollars.

Employment in 1958 followed this general pattern:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	*
Contract construction	6.2
Manufacturing	41.7
Transportation and other public utilities	5.3
Trade	18.7
Finance, insurance and real estate	4.5
Service and misc.	10.5
Government	13.1

* None or less than 0.1.

Connecticut

The (a) per capita income and the (b) estimated population were: 1956 (a) 2,673 dollars (b) 2.2 million; 1939 (a) 834 dollars (b) 1.7 million. (a) increased 220.5 per cent and (b) increased 31.1 per cent. Both patterns were superior to the region and the nation.

The (a) number of households and (b) telephones were as follows: 1956 (a) 0.6 million (b) 1.0 million, with 27.7 per cent absorbed by business; and 1939 (a) 0.4 million (b) 0.3 million, with 34.1 per cent absorbed by business. The percentage increases were: (a) 42.8 and (b) 193.5.

There were 2.8 thousand manufacturing plants in 1939 and 3.3 thousand in 1900. Employes numbered 435.0 thousand in 1956, 281.4 thousand in 1939, and 168.9 thousand in 1900.

In millions of dollars, (a) payrolls and (b) value added by manufacturing followed this pattern: 1956 (a) 2,030 (b) 3,385; 1939 (a) 382.3 (b) 690.3; 1900 (a) 85.1 (b) 145.4. For 1956 (a)

(Please turn to page 76)

Participate in Politics, New Yorkers Urged

By Dan S. Fargo

THE CALAMITOUS effects of businessmen defaulting in their responsibilities as citizens were pointed out at the 37th annual New York State Telephone Association convention (June 15, 16 and 17) at Schroon Lake, N. Y., by Cyril M. Joly Jr. of the National Association of Manufacturers.

Registration by 462 people was the largest in many years.

Mr. Joly, who is public affairs director of the eastern division of the NAM, in a talk titled, "Today's Challenge—Defaulting Citizens," urged the group to become politically active in their own communities.

"A revolution is taking place in our country," he said, "and if you and your associates who believe in the principles of free enterprise do not face up to it and take steps to halt the trend toward bigger and more expensive government, and higher stifling tax rates, you may find yourselves engulfed in a wave of ultra-liberal measures."

Mr. Joly added that the NAM has for some time been vitally interested in the field of public affairs, and has been vigorously attempting to stimulate the business elements of the country to assume their rightful places in the political picture.

He stated: "We find this difficult because many businessmen still associate politics with nefarious activities."

He observed that businessmen were well represented among the signers of the Declaration of Independence, the authors of the Constitution, and the members of the first House and Senate. Today some excellent local governments are fortunate to have businessmen involved in the operation of municipal affairs. However, much more participation is needed than is going on today, he said.

Mr. Joly pointed out that "politics is the process for the orderly change in the objectives and personnel of government." He described the three-pronged NAM public affairs program—information, education, and legislative activities.

Commenting on the tremendous power that organized labor has mustered, resulting in its political activity being most effective, Mr. Joly said there can never be any objection to labor engaging in political action; but, if business and industry desire to have their points of view well represented, businessmen must accept a comparable role.

Presiding over the first day of the three-day meeting was Albert N. Seward of Jamestown.

Presiding the second day was the as-

Officers and directors of New York State Telephone Association pose with public service commissioners. Seated (L. to R.): Treasurer W. Malcolm Griswold of Phelps; Vice President Clifton E. McCormick of Johnstown; President Albert N. Seward of Jamestown; Public Service Commission Chairman James A. Lundy of Douglaston, L. I.; Executive Secretary Hamilton A. Cunningham; Frank D. Fancher of Middletown (member of the board since inception of New York State Telephone Association in 1921). Standing: C. Ray Lloyd of Manlius; William A. Kern of Rochester; Sheldon A. Birdsall of Margaretville; Fred S. Florance of Monroe; Public Service Commission Deputy Chairman Spencer B. Eddy of Saratoga; William A. Seely of Norwich (also a board member since 1921); Secretary-Assistant Treasurer George S. Beckwith of Keeseville. *Absent* when picture was taken were: Robert Maytum of Fredonia, and Don W. Walker of Newark.

sociation vice president, C. E. McCormick of Johnstown; on the third, C. Ray Lloyd of Manlius, a past president.

In his report, Mr. Seward urged association members to give the group's executive secretary full cooperation when he sends out bulletins asking assistance in writing to legislators and others influential in passing legislation. He said he was sure this cooperation was not asked unless definitely needed.

Mr. Seward also stated: "At our convention, we come to learn, to be instructed, and also to contribute something worthwhile to our friends and fellow members . . . Exchange of knowledge and information at these meetings opens our eyes to many things. We learn what others are doing and also we learn to place a better value upon our own work and efforts . . .

"The purpose is to bring you knowledge and information in a way which will arouse your enthusiasm and create within you a better spirit in which to return to your homes and put more punch and vigor into the work of your company."

Mr. Seward remarked it has been said that human progress has been possible because of man's desire to live beyond his income. He also said:

"No one can feel absolutely secure in business but must keep pushing ahead at all times, regardless of prosperity or favorable circumstances."

"Service is the watchword of our business and service given in the most economical manner possible has been the motto under which the telephone business has reached its highest development."

Hamilton A. Cunningham's executive secretary's report, along with tribute to the directors' performance and other supporting members and committees, including progress notes on committees studying:

Simplification of accounting procedures for account 232 (station connections).

Adequacy of depreciation rates for several types of plant, particularly station apparatus.

Extended area service agreements, especially with New York Telephone Co. (Bell).

From the committee's efforts on the EAS matter resulted a complete revision of the EAS agreement with the switching charge provisions eliminated and the cable charges calculated at an average charge per circuit mile.

Depreciation Policy

Commissioner Spencer B. Eddy, at the request of Executive Secretary Cunningham, made a statement during the convention clarifying the New York Public Service Commission's policy on treatment of accelerated depreciation for rate case purposes.

Commissioner Eddy made the following points:

(1) Accelerated depreciation is a device to reduce income taxes.

(2) It is up to management to decide whether or not a company is to adopt accelerated depreciation.

(3) It is better for both the company and its customers if the company uses every possible legal device to reduce expenses such as taxes, as that helps to keep the rates down.

(4) There will be no penalty for companies which continue to use straight line depreciation for tax purposes. The New York commission's policy differs from that of the Maine commission in this respect.

(5) Where companies adopt accelerated depreciation, the benefits will be shared as the commission will allow the company a somewhat higher rate of return than otherwise while authorizing lower rates to the customers.

Mr. Cunningham also stated that a suggestion had been advanced that a one-day meeting of Independent company executives be held—"without the disturbing element of outside influences (cocktail parties, etc.), and in an atmosphere free from the restraint of the presence of employes."

In such a setting, it was thought, executives could discuss among themselves such policy matters as financing, employe relations and related personnel problems, pension programs and a multitude of other subjects of vital interest to management people. Mr. Cunningham said the general concept would be a *working* conference, separate and distinct from either the annual convention or the district meetings. He added: "The idea has much merit in our opinion, and if we get the support of our members, we will sponsor such a meeting in early spring."

Mr. Cunningham's comments on the state legislative scene:

"Viewed from a 'hind-sight' situation, except for the enactment of the income tax withholding law and the closely related tax and budget bills, legislators generally were apathetic to any measures which might 'rock the boat.' We could interest no one in the relocation reimbursement bill, for instance.

"We view the 1959 session as a breathing spell (getting the new administration's feet on the ground)—and as having produced no tidal wave of reform insofar as business and industry grievances are concerned. We agree with many seasoned observers in Albany that the basis was laid for later corrections.

"We are now confronted with a problem of continuous and vigorous follow-up, of study and action to insure delivery on direct and implied promises. We want to help the governor achieve his goal of making every tax dollar count in the future.

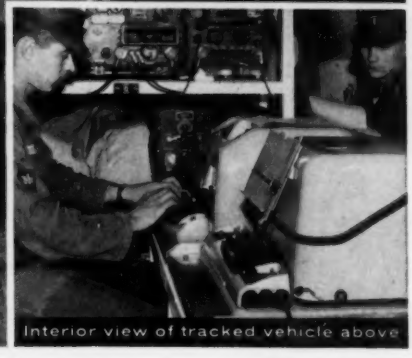
"But, it all boils down to the truism that government is *everybody's* business—365 days a year—not just during a campaign or the legislative session time."

(Please turn to page 34)

View of part of the crowd in attendance at the opening session.

COMBAT MOBILITY

telecommunications move up-front with the advance



Interior view of tracked vehicle above

Kleinschmidt teletypewriters maintain constant contact, in print, between U. S. Army command and field positions

On the go...bouncing over bunker or beachhead ...Kleinschmidt teletypewriters accurately, efficiently send and receive printed messages. Developed in cooperation with the U. S. Army Signal Corps, these units instantly provide both sender and receiver with identical data...*printed on paper!* In recognition of its quality, Kleinschmidt equipment is manufactured for the U. S. Army under the Reduced Inspection Quality Assurance Plan. This kind of proved experience is now available for unlimited advances in electronic communications for business and industry.

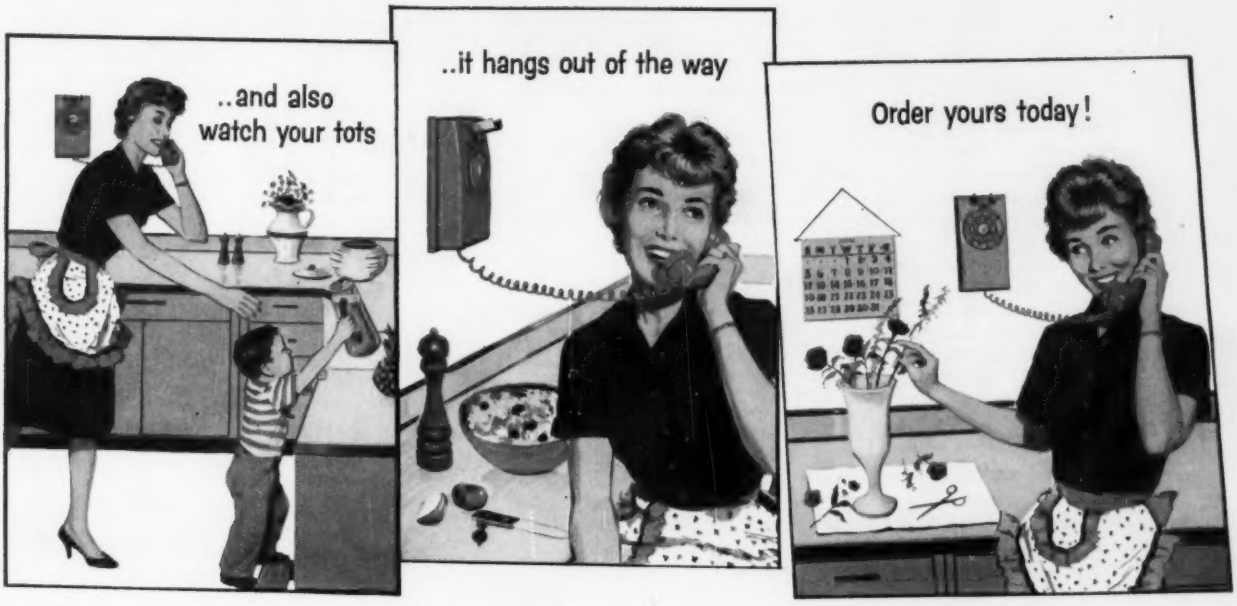
KLEINSCHMIDT

DIVISION OF SMITH-CORONA MARCHANT INC., DEERFIELD, ILLINOIS

Pioneer in teleprinted communications systems and equipment since 1911

A kitchen telephone is...

This cheerful recital of the values of a kitchen extension is from a Bell System advertisement appearing in *Better Homes and Gardens* and *American Home*. Its aim is to give homeowners everywhere an idea of the kitchen phone "in action"—the steps it can save,



the trouble it can ward off, the pleasure it can bring.

For if our customers can *see* a kitchen phone in action,

chances are they'll *take* action—by calling their local

business office and placing an order.

BELL TELEPHONE SYSTEM

In 1958, New York Independents added about 20,000 stations in service —an increase of about 3½ per cent over the number of stations in service in 1957, Mr. Cunningham reported. This compares with 4½ per cent growth in 1957.

Less than 4 per cent of the 572,147 stations in service at the first of 1959 were still served by magneto switchboards—only about 18 per cent were common battery stations and, of course, Mr. Cunningham said, these figures are out-of-date today because of conversions to dial service accomplished since Jan. 1; 78 per cent, then, of all Independent telephone stations in New York state are dial stations.

Registration desk is busy place as conventioneers converge in move to get badge.

United States Independent Telephone Association President Hugh A. Barnhart of Rochester, Ind., gave a talk titled, "The USITA Looks at the Present and the Future." In it, he said, "The most important service of USITA, at least the one which means more to us in dollars and cents, is that of obtaining for our companies our proper share of toll revenue. Realization of this was what prompted us a few years ago to employ the services of a full-time toll engineer and to set him and his associates up in an adequately-equipped department. This step is paying off, and it will be even more compensating to our companies as time goes on.

"Back in 1935 the amount accruing to Independent companies on message toll settlements with Bell associated companies was only 12 million dollars. In 1953 an 18-million-dollar increase was negotiated by USITA. In 1957 the settlement total was 186 million dollars, the 1958 total is 204 million dollars.

"Of course, part of this is due to a gradual increase in long distance business. But I want to emphasize that much of this income gain came as the result of our Toll Compensation and Settlements Committee's work. The toll committee has been working for a long time with the Bell relative to our obtaining a larger share of toll income in the near future."

Mr. Barnhart went on to say that the full USITA Toll Compensation and Settlements Committee and top Bell officials met in New York late in April for near-final-stage discussions of basic plans for the current toll settlement and future ones. They were to gather again in that city on June 8.

In these conferences on tolls and other matters of joint concern, he said USITA has not lost sight of the fact that the Bell and Independents together are engaged in a great common enterprise, that there must be harmonious relationships and good will existing among them and that there must be continued mutual confidence and respect.

As for legislative activity, Mr. Barnhart said:

"The elimination of excise taxes on telephones has been and is a major project of USITA. The USITA has been urging Congress for a number of years to remove this discriminatory financial burden. This year our tax committee has stepped up the tempo and if all you Independents do not know the full story it is because you don't read . . .

"Also I want to remind you of the recommendations made by the federal-state action committee last summer. This group of federal and state officials appointed by the President, favors transferring to the states a certain percentage of this revenue presently accruing to the federal government. If this is done, it means that the federal government would collect 6 per cent of the present tax and the state governments would collect 4 per cent, thus adding to the complexity of tax collections.

"The subscriber would not benefit one iota. Once your state started collecting telephone excise taxes, they would be in force forever and through the years they would grow and grow and grow. I regret to inform you, however, that such a bill probably will be introduced during the present session of Congress."

There is a definite trend in Congress to rewrite the Fair Labor Standards Act, Mr. Barnhart reminded his listeners. The Kennedy bill, with many sponsors, already introduced in the Senate, and a companion bill in the House, provide for a minimum wage of $1.25 per hour. It also would restrict the ap-

(Please turn to page 59)

Visitors to the convention standing to be greeted were (L. to R.): Stephen Martin, Frank Roberts and Thomas Mason, all from the Delaware County Christian School, Newton Square, Pa. Mr. Roberts is head of the science department at the school; Martin and Mason are star students and Martin has decided to become a telephone engineer.

MICROWAVE
CABLE
OPEN WIRE
SYNCHRONOUS CARRIER SYSTEMS

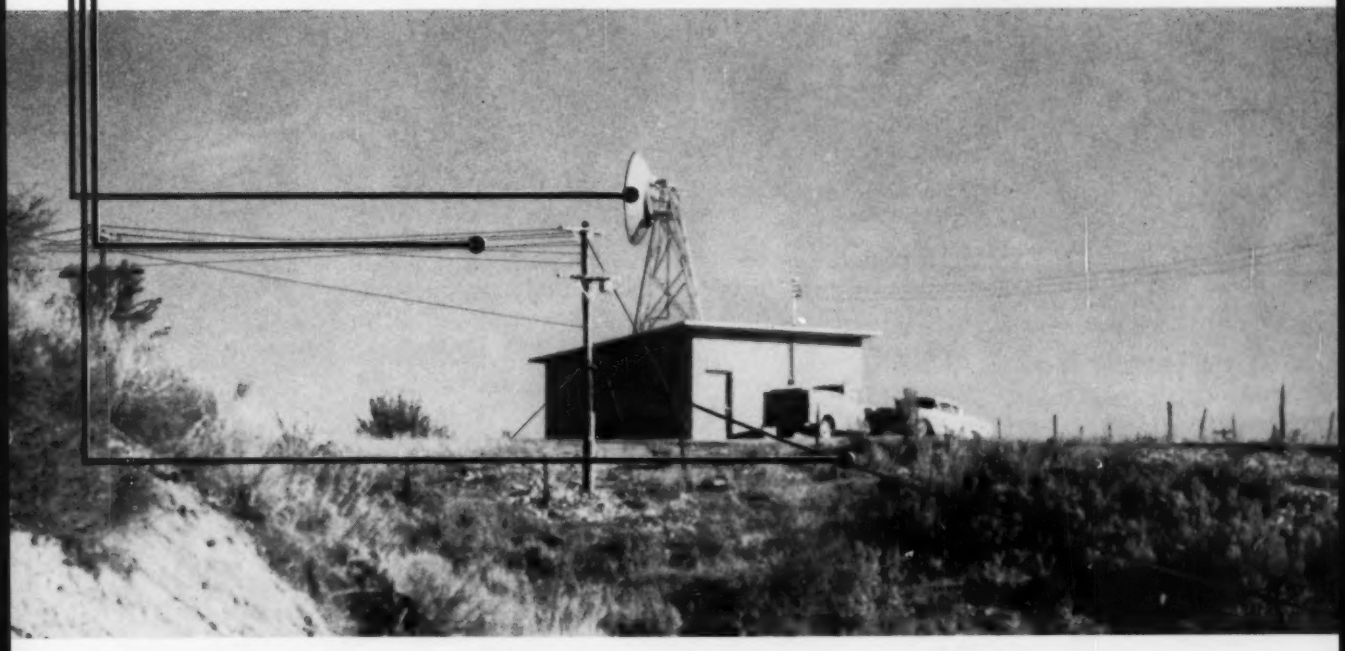
Collins now offers compatible Carrier Systems for open wire, cable and microwave transmission facilities. These systems present a unified solution to the requirements imposed by the increase in wire line and cable systems for short haul applications, as well as the increase in microwave radio. Collins systems enable interconnection of channels at carrier frequencies for various open wire, cable or radio combinations.

Carrier channels may be extended to remotely located microwave sites by open wire or cable lines — or small groups of carrier channels may be extended over wire lines to light traffic areas in different directions. Collins Microwave, Open Wire and Cable Carrier Systems are readily integrated with existing wire line and cable facilities as well as with similar types of existing carrier systems.

The Collins MX-102 Microwave Carrier System can provide up to 240 duplex voice channels on an RF path; the WMX-102 Open Wire Carrier, 12 duplex channels on each open wire pair, is available with "NA" or "SA" allocations and is suitable for operation over lines transposed for "C" and "J" type carrier; the CMX-102 Cable Carrier, 24 duplex channels on two cable pairs, is designed for application to "N", "ON" or similar type cable facilities. All use the standard channel bank of 60 to 108 kc, reducing the number of modulations steps required when circuits are extended over several types of transmission media.

Features of Collins Carrier Systems include synchronous operation for efficient data transmission; complete regulation and frequency equalization for the particular transmission medium. Modular construction results in flexible system design, ease of expansion and simplified maintenance. For technical literature, write: Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

COLLINS HAS ALL THREE



COLLINS

COLLINS RADIO COMPANY • DALLAS, TEXAS • CEDAR RAPIDS, IOWA • BURBANK, CALIFORNIA

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

WE HAVE contended for some time now that party line service would eventually go out of the picture in this country. Our subscribers use their telephones entirely too much in this present age to be able to share them with others.

Now we learn from the Southwestern Telephone *News* that two of Oklahoma's districts, Shawnee and Muskogee, have reached their goal to eliminate entirely the "Vanishing American"—the four-party service subscriber.

The article explains this action as follows:

"Many telephone people have known for some time that four-party (service) would have to go. Back in the forties, nearly half of Southwestern's customers had accepted four-party service, but mostly because this was all the company could offer. As facilities became available, fewer and fewer people wanted the annoyance of tied-up lines, interrupted calls, delays, intraline "warfare," and the bloodshed that went with it.

"Fewer people used four-party service. From 42.7 per cent in 1950, four-party use dropped to 40 per cent in 1951, 39 per cent in 1952, 37 per cent in 1953, and 31.5 per cent in 1954.

"This made four-party service hard to provide. Expensive 'bridging' had to be arranged in central offices. Lines had to be re-arranged to bring sparse four-party customers together. Four-party lines were harder to maintain, too. This meant more complaints, still fewer customers.

"And one more big reason, DDD was coming. Four-party customers would not be able to use direct distance dialing. In short, when four-party service, created for efficiency, became less efficient than one- or two-party service, sales tribes all over the company hit the warpath.

"These are the first two districts in Oklahoma to eliminate four-party service. There will be others, of course, each district-wide elimination providing better, more efficient service for the districts and telephone customers all over the country."

At present, there is a country-wide trend toward the upgrading of telephone service. The elimination of party lines is an important part of this program. We predict that party-line elimination will increase at a rapid rate as this program progresses and subscribers realize the many advantages of one- and two-party service. Moreover, we believe that at some future date, party lines will be eliminated entirely and only then will we all enjoy the numerous advantages of one-party service. When this becomes a reality, a majority of our residences will then have more than one line.

•

The Chesapeake & Potomac Telephone Co., in Washington, D. C., used to advertise that you could make a call —three minutes and station-to-station— anywhere in the United States for $2.00 or less, after 6 p.m. or anytime on Sunday.

Recently, a man called the long distance operator and inquired as to whether this statement was true.

Having great faith in the honesty of the advertising people, she replied: "Well, sir, if you read it in one of our ads, it must be true."

"That's fine," said the man. "Give me one of those $2.00 calls to Fairbanks, Alaska."

So now the C&P's advertising is being modified slightly. It advises that you can still call anywhere in 48 of the states for $2.00 or less, after 6 p.m., or on Sunday. But calls to the 49th and 50th states do cost more. For instance: a three-minute call from Washington, D. C. to Fairbanks, Alaska, costs $7.50 and to Honolulu, Hawaii, the charge is $6.75. Then, to be completely honest, there is a 10 per cent federal excise tax that is added to the cost.

•

If anyone is interested in rockets, and who isn't these days—we can suggest two books on the subject that can be purchased from TELEPHONY. These two volumes entitled "Basics of Missile Guidance and Space Techniques," and totaling 304 pages may be purchased as a set of two individual paper-bound volumes for $3.90, or both in a single cloth binding for $9.00.

Electronics is playing a vital role in the race to achieve mastery of outer space and to send manned missiles rocketing to the moon and beyond. This two volume "picture book" course does an excellent job of making understandable the fundamentals of the important areas of electronics that will contribute to the conquest of space.

Volume I covers the principles of control and guidance. Extensive coverage is given to methods, fundamentals of gyroscopics, inertial guidance and celestial navigation, computer applications, and actuators, as well as their related components.

In the second volume, telemetering, space exploration by optics and electronics, satellite theory and practice, satellite monitoring and tracking as well as applications of earth satellites are covered.

Navigation in space along with components and power sources for space applications conclude the volume.

These two volumes are not intended to teach the design of guided missiles, but everyone now engaged in the guided missile field, or who views this area of employment as a possible career, will find this course thoroughly readable and extremely informative.

•

Radio Russia claims that the United States is a hysterical topsy-turvy country where people eat upside-down-cake, doors go around in circles, and everybody has an inside outhouse.

•

We are informed that money saved for a rainy day now buys a much smaller umbrella than formerly.

•

The Indiana Bell Telephone Co. states that their cable protection signs

more oomph

Like some people, some derricks have a little extra oomph. This derrick—Holan's Series 6800 has it . . . especially in the lower operating ranges.

The 6800 has extra strength because of extra lift cylinders—four instead of two. It lifts 2,000 pounds when only 5½ feet from the ground . . . body-loads 4,000 pounds. Capacity is 8,000 pounds.

More digger oomph, too

The digger here is Holan's 3-speed Series 5400. Maximum torque is 8,400 foot-pounds—tops by far among derrick-suspended diggers. With the power of the derrick and digger combined, you could bore through just about anything.

If you are in the market for power equipment with that extra oomph, get in touch with a Holan Field Representative.

Holan Corporation, 4100 West 150th Street, Cleveland 35, Ohio
Plants in Cleveland, Ohio; Griffin, Georgia; Phoenix, Arizona

Holan

Subsidiary of THE OHIO BRASS COMPANY

HOLAN

are generally observed, but that there are exceptions. In one case, a workman hung his jacket on the "buried cable" warning sign and dug into a cable.

•

The Census Bureau has completed what it considers to be the first systematic measurement of total civilian travel in the United States.

It reports that on any given day, 3.5 million persons are on overnight trips, or at least 100 miles from home. Half of the travel is for the purpose of visiting relatives and friends, 25 per cent is for vacation and pleasure, and 20 per cent of the trips are for business purposes. Two out of every three trips are within 200 miles of home and last less than five days. Seven out of eight trips are made by automobile.

This high travel rate is no doubt responsible for the large volume of telephone toll traffic which is certain to increase still further in the future. It also indicates the necessity for adequate telephone service in motels and for outdoor paystations along our main traveled highways.

•

A new tool item, a lock-grip plier, should prove extremely useful in the communications field. This device is specifically designed for small assembly work, but is also useful to pick up and

firmly grasp small parts for soldering or other operations. Actually, on delicate work it serves as a vice so that both hands may be free.

This tool also can be used as a wire cutter and insulation stripper.

•

The United States farm population is down 17 per cent since 1950. One in eight Americans now live on farms whereas one in three lived on farms in 1910.

•

We are advised that to become perfectly content, it is necessary to have a poor memory and no imagination.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Can you recommend a good book on the design of transistor circuits?

A. The best book that we know of on this subject may be purchased from TELEPHONY and is titled: "Principles of Transistor Circuits." This soft cover book of 176 pages sells for $3.90.

The author, S. W. Amos, has successfully accomplished the task of conveying the fundamentals of design of transistorized circuits without wasting words. Although every type of circuit is not covered, those which were chosen are wise selections. They are typical of the varieties that must be known to the junior engineer and electronic laboratory technician for whom this book was written.

The beginning of this book is devoted to a lucid explanation of semiconductors, junction diodes, covalent bonds, donor and acceptor impurities, intrinsic and extrinsic germanium, PN and NP junctions; the point contact transistor and junction transistor. An excellent job has been accomplished explaining current amplification factor, voltage gain, power gain, alpha and alpha cutoff frequency.

The main portion of the book is, however, devoted to a comprehensive discussion of many types of amplifier circuits; the transistor superheterodyne receiver; transistorized multivibrators; dc converters, and several other forms of circuitry.

All in all, it is believed that the author has scored a "bull's eye" on the target at which he aimed. The book is well written, well illustrated, and easy to read.

The numerical examples of design problems expand the usefulness of the text to the serious experimenter who has a background in electronics and who desires to probe the operation of these circuits more deeply.

•

Q. Can you advise us whether or not the wire wrap connection, without soldering, is considered satisfactory for communication work?

A. This type of connection has been extensively used for the past several years and we understand that it is proving entirely satisfactory. The wire wrap, without soldering, is to be used on jumper wire on a new main frame protector now being tested on a field trial basis.

The only difficulty that has ever come to our attention with the wire wrap was on connections made with the tool after it had become worn. Now, gauges are used and the worn parts in the tool are replaced before they can cause trouble in a loose wrap of the connection.

•

Q. Can you furnish information on the installation of pressure plugs on cable so that it can be maintained under gas pressure?

A. We suggest that you consider the use of a pressure gun. A hole is first drilled into the sheath and the pressure gun is used for injecting plugging compound into the cable. This gun may be purchased from your telephone supply house.

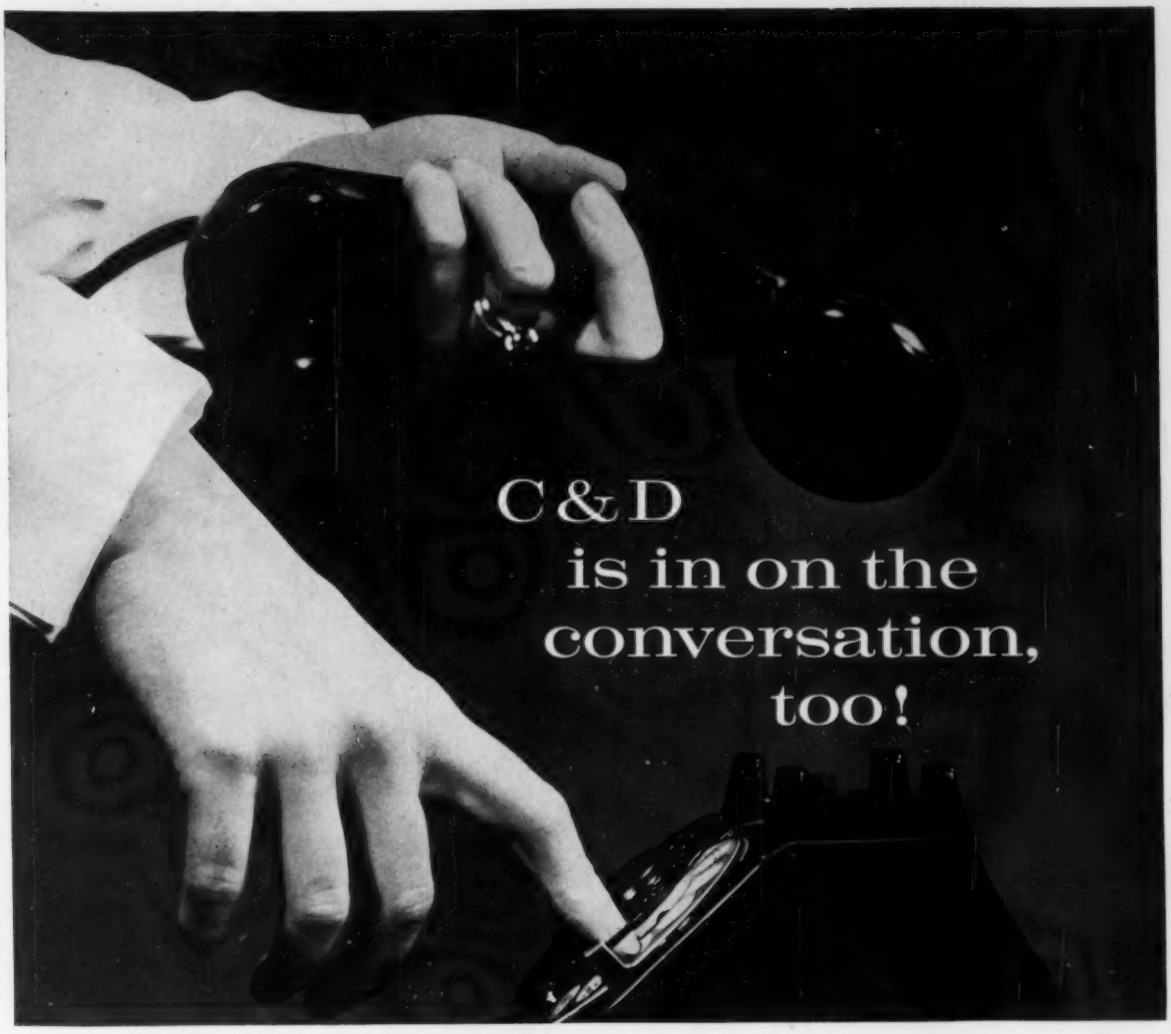
•

Q. We are frequently requested to provide private telephone line service in our rural area where the cost of stringing additional wire is considered prohibitive. Do you know if it would be possible and economical to use carrier equipment to provide this service?

A. A practical, low-priced subscriber's carrier system, designed especially to provide high-quality private line service on a multi-party line is now available. This system can be used in practically any kind of system, manual or dial, bridged or divided ringing.

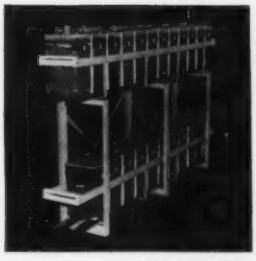
Four "stackable" channels are available, with operating frequencies in the range of 12 to 96 kc. Private line service can be furnished to one, two, three or four subscribers on any party line without mutual interference.

A high degree of technical skill is not required for the installation of this system. By following the simple instructions, any qualified telephone maintenance man can make the installation in a few hours without any special training. Maintenance is simple and economical.



Advanced PlastiCell and PlastiCal® battery power assures dependable telephone service for California Water & Telephone Co. system

Furnishing dependable communication service for a network of 146,000 telephone stations and 325 PBX installations in the Los Angeles, Riverside, and San Bernardino County areas calls for top quality equipment.



Typical of the many high quality C & D PlastiCell and PlastiCal® batteries located in central offices, exchanges, and subscriber firms is this 420 amp-hr, 23-cell PlastiCell CE-420 battery. The battery is used to power one of the company's larger PABX telephone installations.

C & D pioneered the convenient, shockproof, clear plastic case telephone battery. Both PlastiCell (conventional lead-antimony grid) and PlastiCal® (advanced lead-calcium grid) batteries feature *triple*-insulated, *full .266" thick* plates for extra capacity and extra life. PlastiCell is designed to give 14-year life in full-float service — PlastiCal, *25 years*. Besides, PlastiCals require watering only about once a year!

For battery details, send for new C & D Bulletins T-532 and T-533. Your C & D representative or telephone equipment supplier will be glad to discuss your specific battery requirements.

C&D

Since 1906

C & D BATTERIES, INC.

of Conshohocken, Pa. ... Attica, Ind.

Sales and Service Offices in Principal Cities from Coast to Coast

Manufacturers of Dyna-Cel® Industrial Batteries • PLASTICELL and PLASTICAL® Batteries for Communications, Control and Auxiliary Power • Producers of Autolay* • Silicon Chargers

*Trademark

NEW compact

SUPPLIED WITH

attendant cabinet

AUTOMATIC'S P-A-B-X SYSTEMS

Here's the new Type 51 Attendant Cabinet. *It uses less desk space than a typewriter!* Yet it efficiently handles up to 10 trunks and 80 lines! This cordless unit is standard equipment with the Type 25B P-A-B-X System. It can also be used with Types 50B and 75B.

Trimline Styling, a new streamlined design, gives the Type 51 its compact shape. It's only 13¾″ wide x 8″ high x 7″ deep! Because the key panel is slanted, the Type 51 uses a minimum of desk space and the supervisory lamps are easy to see. The smart two-tone gray finish blends into the color scheme of any office. It's easy to operate, too—even an inexperienced person learns how in a short time. This modern attendant cabinet is sure to please your business subscribers. You'll find it a valuable help in selling P-A-B-X.

Stock Delivery! Automatic Electric gives you stock delivery on *all* six of its P-A-B-X Systems. This means you can offer businesses, large and small, a ready-made P-A-B-X System. It means you can give quick shipment, too. You'll build sales as well as satisfied customers.

Write for Circular 1922!

It tells all about our desk and floor-type attendant cabinets. Address: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call, Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.*

AUTOMATIC ELECTRIC

GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

Courts and Commissions

Miss. High Court Orders Refund of 1956 SBT&T Raise

The Mississippi Supreme Court on July 2 denied the Southern Bell Telephone & Telegraph Co. a 2.5-million-dollar rate increase in effect under bond since 1956, and ordered these additional rates, collected over a three-year period, to be refunded (TELEPHONY, Sept. 27, 1958).

The refund will amount to nearly 9 million dollars including $900,000 representing 6 per cent interest per year.

The Mississippi Public Service Commission had denied the increase in 1956 and the company had appealed the denial to the Hinds County Chancery Court. On June 19, 1958, Chancellor Arnold Pyle affirmed the commission ruling.

The supreme court's decision was a unanimous affirmation of the lower court order.

Justice John Kyle, who authorized the supreme court ruling said: "We find that the rates prescribed by the commission are just and reasonable and such as to yield a fair rate of return to the applicant upon the reasonable value of the property."

The commission in 1956 set the value of the company's properties "used and useful" in the state at $60,568,000 and on that basis the company had intrastate earnings of some 5 per cent on its rate base. The company had valued its property at about 72 million dollars.

Arnold Hirsch, rate expert hired by the commission, testified that for the risk of business involved, the company's bond financing was not low enough and too much common stock was held by AT&T.

Because of this, Justice Kyle wrote that the commission "had a right to adopt a hypothetical capital structure" for figuring a rate of return.

For a test period, Justice Kyle noted, the commission figured the company would realize a fair return by earning 4.96 per cent to 5.03 per cent on the "reasonable value" of its property.

"Such rates of return may appear to be low," Justice Kyle said, "as compared with the rates allowed in some other states. But the rate of return in our opinion is not confiscatory . . . we find the order of the commission is amply supported by substantial evidence . . . the order violates no constitutional right."

Public Service Commission President Norman Johnson Jr. said growth of the company during 1958 alone reflects a "healthy" economic structure. During 1958, he said, the company added 33,000 subscribers in Mississippi alone.

Clarence Lott, vice president of Southern Bell stated, "during the long period of litigation with respect to our rates, we have invested over 45 million dollars for telephone expansion and improvements in the state."

Minn. Independent Granted Raise for Dial Service

The Chisago City Telephone Co. on July 7 was granted a rate increase by the Minnesota Railroad & Warehouse Commission effective when the Taylors Falls exchange has been converted to automatic operation.

The Chisago City company on July 21, 1958, purchased the Taylors Falls distribution system from the General Telephone Co. of Wisconsin. At present, switching for Taylors Falls subscribers is done by the General of Wisconsin company's exchange at St. Croix Falls, Wis.

With an REA loan of $136,000, the Chisago City company plans to rehabilitate the Taylors Falls system and establish an automatic exchange at Taylors Falls. Extended area service will be provided between Taylor Falls and the company's exchanges at Almelund and Lindstrom as well as General's exchange at St. Croix Falls.

The project is scheduled for completion by March, 1960.

Through exchanges at Chisago City, Center City, Almelund, Lindstrom, and the planned exchange at Taylors Falls, the company serves 1,259 local and 1,273 rural stations.

The company, under its old rates, has a net income of $38,462 out of net operating revenues of $152,464. This represents a 4.05 per cent rate of return on a rate base of $948,972. Net operating revenues with the new rates will be $165,666 giving the company a net income of $46,428 and a rate of return of 4.89 per cent.

Present and approved rates for Taylors Falls are as follows:

	Present	*Approved*
One-party business	$6.00	$8.60
Two-party business	4.90	7.50
Multi-party rural business	3.70	6.00
One-party residence	3.50	5.00
Two-party residence	——	4.25
Four-party residence	2.55	3.75
Multi-party rural residence	2.70	4.25

Missouri Independent Granted Sale Approval

Approval of the sale of the Clover Leaf Telephone Co., Polo, to the Green Hills Telephone Corp., Breckenridge, has been given by the Missouri Public Service Commission, it was reported on June 17 (TELEPHONY, May 30).

The Green Hills company was authorized to discontinue toll free service between Kingston and Polo effective June 30, on cutover to automatic operation, it is also reported. Green Hills' exchanges include Dawn, Ludlow, Lock Springs, Mooresville, and Breckenridge.

Texarkana, Tex.-Ark. Rates Hinge on Tex. Court Case

Judge Guy Amsler, in Pulaski Circuit Court, Little Rock, Ark., on June 24 indicated that for Texarkana, Ark., he would follow whatever ruling Bowie County (Tex.) District Court handed down on rates for Texarkana, Tex., awarded General Telephone Co. of the Southwest.

General of the Southwest serves both cities, which adjoin each other at the state line. The company on May 14 was authorized by the Arkansas Public Service Commission to raise rates in the state by $203,652.

It was reported on June 25 that the position taken by Pulaski Circuit Judge Amsler appeared agreeable to officials

of General of the Southwest and to the Texarkana, Ark., city attorney.

The city of Texarkana, Tex., on June 20 filed at Boston, Tex., a petition asking that the Bowie County District Court temporarily restrain General from charging the new rates, pending a rate hearing before the Texarkana, Tex., city council.

On June 22 the city of Texarkana, Ark., filed with the Pulaski Circuit Court its appeal of the rate increase granted General of the Southwest. The Arkansas section of the city alleged that the commission erred in holding that the company had a deficiency of $203,652 in gross revenues and in allowing a rate increase to offset this.

OK Raise for EAS, Refuse Long Distance Changes in Ga.

In separate decisions on two applications by Southern Bell Telephone & Telegraph Co., the Georgia Public Service Commission on July 2 approved rate increases for the city of Atlanta but refused to change rates for intrastate long-distance calls (TELEPHONY, May 2).

The Atlanta increase will go into effect in October 1960 when the company's Atlanta metropolitan service plan featuring extended area service with 15 communities and direct distance dialing goes into effect.

The company also was allowed to regroup some exchanges and to expand base rate areas in other sections.

The approved rate revisions are estimated to give Southern Bell a net increase of $2,227,000.

The company had sought to reduce toll charges on intrastate station-to-station calls while increasing person-to-person charges.

It had also asked to impose a 20-cent charge on all collect intrastate station-to-station long-distance calls and to eliminate lower rates for calls made on Sundays and after 6 p.m.

The commission said it denied the long-distance rate revisions because this was not a major rate case; there was not sufficient evidence submitted by the company to justify the additional revenue sought of 1.5 million dollars (before taxes); and because the company's estimates in calculating the increase depended too much on the company's judgment.

In approving the Atlanta rate increase, the commission also set Apr. 1, 1961, as the final date for completing the plan by adding five other areas.

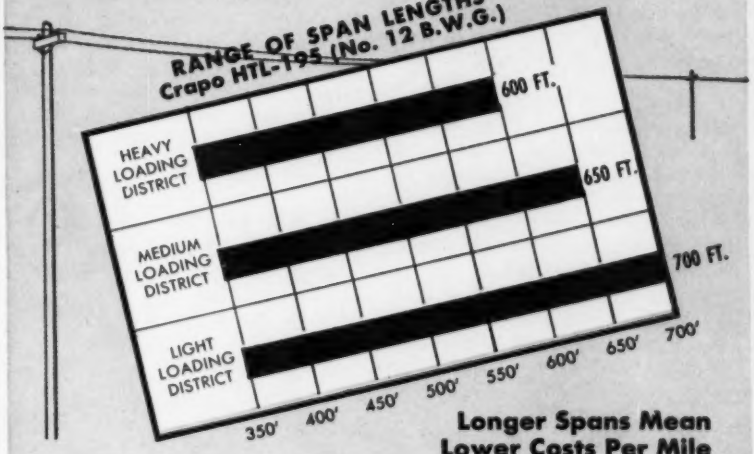
Communities to be joined in the plan by October, 1960, are Marietta, Roswell, Norcross, Duluth, Stone Mountain, Lithonia, Stockbridge, Jonesboro,

Crapo

HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The NEW LOWER Resistance Extra-High Tensile Line Wire

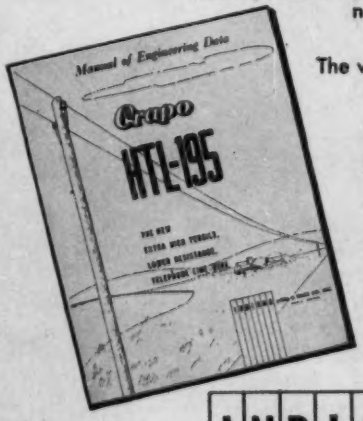


Longer Spans Mean Lower Costs Per Mile

You can cut the number of pole structures to a minimum when you use Crapo HTL-195 in building rural telephone lines. Extra long span construction, made possible by the high physical strength of this new wire, means marked savings in material and installation costs.

The voice transmission quality of Crapo HTL-195 is equal to that of Crapo HTL-135 and superior to older grades of ferrous wire.

Pertinent technical data have been prepared to assist engineers in designing and building extra long span lines with Crapo HTL-195.



WRITE TODAY for FREE COPY of the CRAPO HTL-195 "Manual of Engineering Data" No. A-195

INDIANA STEEL & WIRE COMPANY, INC.
MUNCIE, INDIANA

Fayetteville, Fairburn, Douglasville, and Austell. Joining them in 1961 are Alpharetta, Conyers, Palmetto, Powder Springs and Smyrna.

United Telephone Co. Granted Raise in Ark.; OK Sale

The United Telephone Co. of Arkansas on June 30 was granted permission by the Arkansas Public Service Commission to raise rates by $38,228.35 (TELEPHONY, May 16).

This amount is $9,714.53 less than the company had sought.

The increase will give the United company a 6 to 6.25 per cent rate of return on its rate base of net original cost of plant, plus materials and supplies, and an allowance for cash working capital.

The company serves Trumann, Siloam Springs, Bay, Black Oak, Caraway, Clarendon, Holly Grove, Lake City, Leachville, Manila and Monette.

•

Also in Arkansas, the E. Ritter Telephone Co., Marked Tree, a new corporation was authorized to purchase the telephone properties of E. Ritter & Co. (TELEPHONY, Jan. 17).

The company serves Marked Tree, Lepanto, Midway and Keiser.

The new corporation was also allowed to issue 3,744 shares of its common stock at the par value of $100 each to E. Ritter & Co.

Indiana Company Petitions For Rate Increase

The Lanesville Telephone Co. on June 22 asked the Indiana Public Service Commission to approve a 100 per cent increase in rates for its subscribers.

Rates for all classes of service would be doubled under the company's petition.

The schedule is as follows:

	Old	*New*
One-party residence	$1.50	$3.00
Party-line residence	1.25	2.50
One-party business	2.25	4.50
Party-line business	1.75	3.50

Las Vegas, Nev., Company Petitions for Rate Raise

The Southern Nevada Telephone Co., Las Vegas, has asked the Nevada Public Service Commission for a rate increase, it was reported on June 29.

The proposed increase would provide about $800,000 a year more revenue for the company, but more than half of this, the application states, would go for taxes.

OK Bill to Pass Hearing Costs on to Utilities in Del.

A bill requiring utilities to bear the costs of rate hearings and investigations by the Delaware Public Service Commission has been passed by the Delaware legislature.

The measure was amended prior to enactment to trim the maximum charge in any year from $75,000 to $50,000 and to require the commission to submit an itemized bill to the utility.

Prescott Company Sells to Creston Mutual in Iowa

The Prescott (Ia.) Telephone Co. sale to the Creston (Ia.) Mutual Telephone Co. was reported on July 2. Sellers in the transaction were Maurice Hogan, president; and Dean Green, secretary-treasurer.

E. G. Carlson is general manager of the Creston company, which assumed operation of the Prescott company on July 1. Mr. Carlson said that the company plans to install dial telephones in the Prescott area, and that construction to house the equipment is expected to be completed by next spring.

Emergency Party Line Use Bill OK'd by Ill. Legislature

The Illinois legislature recently approved a bill making it a misdemeanor to refuse to give up a party line in case of an emergency (TELEPHONY, Mar. 21).

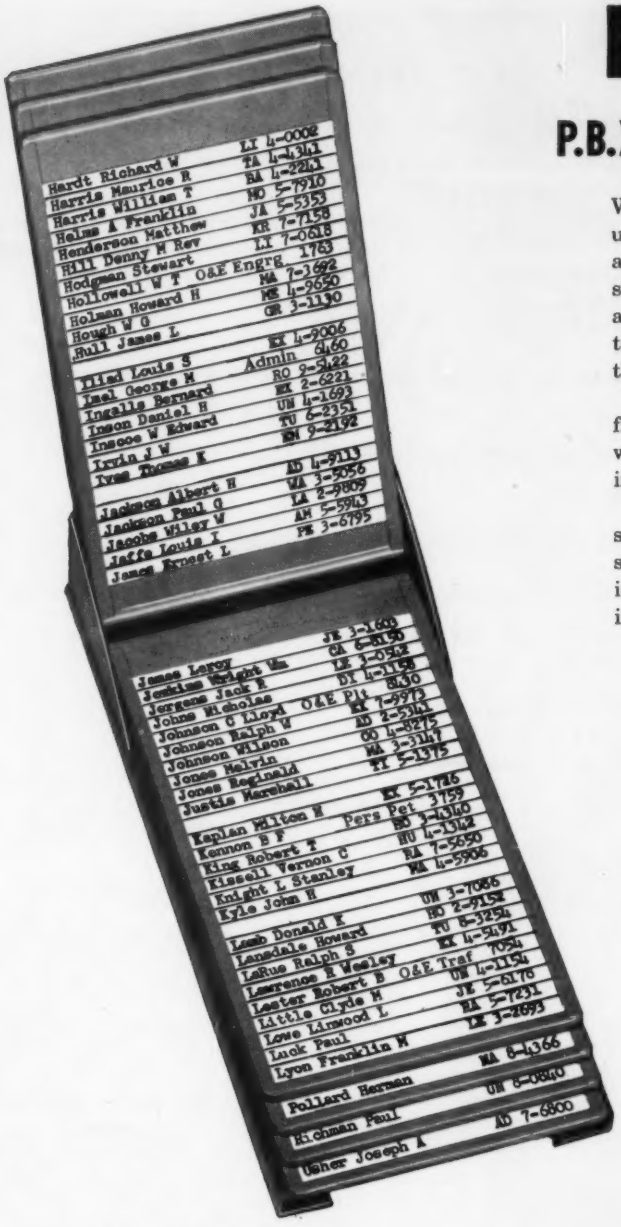
The bill reads:

"Any person who willfully refuses to yield or surrender the use of a party line to another person for the purpose of permitting such other person to report a fire or summon police, medical, or other aid in case of emergency is

The Virginia Independent Telephone Association jointly with the Chesapeake & Potomac Telephone Co. (Bell) recently held a transmission conference at the Thomas Jefferson Inn, Charlottesville, Va. It was felt by some that the good attendance pointed up the need for more information on transmission, especially in view of the high transmission requirements for successful Direct Distance Dialing. Those who attended the conference are shown above. Six of the conference speakers are in the first row; left to right are: Aldrich Dudley Jr., Guy L. Sloope of Clifton Forge-Waynesboro Telephone Co., Staunton, who spoke on "Subscriber Line Loading"; J. S. Day of Tidewater Telephone Co., Warsaw, who discussed "Resistance Design of Subscriber Loops"; Warren B. French Jr. of Farmers' Mutual Telephone System, Edinburg ("Voice Frequency Repeaters"); E. J. Szczebak of the C&P company ("New Arts in the Telephone Field"); J. B. Spratley of C&P ("Transmission Design and Objectives"), and W. M. Swingle, also of C&P (also on "Voice Frequency Repeaters").

ACME VISIBLE

P.B.X. KEYSHELF DIRECTORY UNITS


Hardt Richard W LI 4-0002
Harris Maurice R TA 4-4341
Harris William T RA 4-2261
Harris A Franklin MO 5-7916
Helms Matthew JA 5-5353
Henderson Rev KE 7-7158
Hill Denny W LI 7-0618
Hodgman Stewart 1783
Hollowell W T O&E Engrg MA 7-1692
Holman Howard H NE 4-9650
Hough W G GR 3-1190
Hull James L KE 4-9006
Illed Louis S Admin 6460
Imel George M RO 9-3422
Ingalls Bernard KE 2-6221
Inson Daniel H UN 4-1693
Inscoe W Edward TU 6-2351
Irvin J W EN 9-2192
Ives Thomas K AD 4-9113
Jackson Albert H WA 3-5056
Jackson Paul G LA 2-9809
Jacobs Wiley W AM 5-5943
Jaffe Louis I PE 3-6795
James Ernest L
James Leroy JE 3-1603
Jenkins Wright Mr CA 6-8190
Jenkins Jack B DI 4-2158
Jergens Nicholas DI 4-8430
Johns M Lloyd O&E Plt KE 7-9973
Johnson C Lloyd V AD 2-3341
Johnson Ralph V AD 4-3275
Johnson Wilson CO 4-3247
Johnson Melvin WA 3-3147
Jones Reginald FI 5-1375
Justis Marshall
Kaplan Milton H KE 5-1726
Kennon B F Pers Pet 3759
King Robert F RO 2-9160
Kinnell Vernon C RU 4-1342
Kissell Stanley KE 7-5550
Knight L Stanley WA 4-5906
Kyle John H
Lamb Donald K UN 3-7086
Lansdale Howard RO 2-9152
LaRue Ralph S TU 8-3294
Lawrence R Wesley KE 4-5491
Lester Robert B O&E Traf 7054
Little Clyde M UN 4-1154
Lowe Linwood L JE 5-8176
Luck Paul WA 5-7231
Lyon Franklin M KE 3-2695
Pollard Herman WA 8-4366
Richman Paul UN 6-0840
Usher Joseph A AD 7-6800

With direct distance dialing, it is essential for users of P.B.X. Boards to have a visible record of all frequently called numbers. Flexoline Keyshelf Directory units are specifically engineered and designed for use on P.B.X. boards and furnish the flexibility of individual Flexoline listings on the keyshelf.

The last Flexoline strip on the front of each frame is *visible* . . . listings may be added or changed without concern for label changing or other indexing detail.

Flexoline strips are furnished in sheets of 42 strips per sheet, pre-scored horizontally to the 1/6" standard typewriter space. Supply of Flexoline is included to completely establish the reference listings and accommodate listing changes.

FOUR SIZES

UNIT NUMBER	NO. OF FRAMES	STRIP WIDTH	LISTING CAPACITY
7-275	7	2¾"	390
7-350	7	3½"	490
13-275	13	2¾"	700
13-350	13	3½"	890

Acme Visible Equipment is designed for telephone use by Systems Engineers in close cooperation with practical, experienced telephone experts.

Call upon our experience—nationwide sales and service to the telephone industry.

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Tell me more about your P.B.X. Keyshelf Directory Unit.

Name_____ **Title**_____

Company_____

Address_____

City_____ **Zone**_____ **State**_____

guilty of a misdemeanor and upon conviction thereof shall be fined not less than $100 nor more than $800, or imprisoned in the county jail for a period not exceeding 90 days, or both such fine and imprisonment."

The bill also provides that any person, who under the pretext of an emergency, falsely asks that the party line be surrendered is also guilty of a misdemeanor and is liable to a fine of not more than $100, 10 days in the county jail, or both.

OK Service at Eudora, Kan.

The Kansas Corporation Commission on July 1 granted authority to the Southwestern Bell Telephone Co. to serve the area formerly served by the Eudora Mutual Telephone Co.

Ask Dividend Issue in Ill.

The Inland Telephone Co., Champaign, on June 24, asked the Illinois Commerce Commission for authority to issue $10,192.50 of its no par common stock in the form of a stock dividend.

Incorporate in Kansas

The Admire (Kan.) Telephone Co. Inc. has been granted a charter of incorporation with a capitalization of $15,000. Durward E. Smith has been named resident agent.

Ask Sale OK in Arkansas

The Arkansas Public Service Commission has been asked to approve the sale of the Louann Telephone Co., England, to Jim A. Roe of Smackover, it was reported on July 3. Mrs. Thelma Beirne is the present owner of the company.

SAFETY THUMB TACKS

By John A. Bracken

Bits of safety reasoning, either pointed or flat, depending upon the way you look at them:

"Be ever alert to promote *Safety*—an accident prevented may mean a life saved."

•

"The way to practice *Safety* is to work *safely*."

•

"Some people are known for practicing *Safety*; others for lack of it."

•

"The fellow that doesn't practice *Safety*, isn't interested in preventing accidents."

•

"Neglecting *Safety* is a bad habit, easy to acquire and hard to break."

Telephone Shortage Hampers Police Work in Indonesia

A lack of telephones is the principal handicap facing the police force of Jakarta, Indonesia, according to Major Sajono, a member of the Jakarta staff service administrative division of the national police. A policeman might have to walk three or four miles to make a call. Major Sajono is visiting the United States studying police record systems and personnel administrative procedures.

He explained that the government owns and controls the nation's telephone system and only government bureaus or private industries can usually afford to obtain telephones.

Communications Ministry Wins Korean Contest

Telecommunications workers from the communications ministry recently won the presidential colors and cup in Korea's third telecommunications contest. The communications ministry has won first place honors in each of the three years.

The 141 contestants vied in 11 different events ranging from simple telephone exchange and telegraph operation to high-speed teletype handling. The transportation ministry came in second, national defense ministry, third, and Trade News Agency, fourth.

Spiraflex® CORD

BY GENERAL INSULATED WIRE WORKS, INC.*

*Licensed to manufacture under existing patents.

Telephone cord sets of proved performance backed by General Insulated's unmatched experience and know-how in the manufacture of quality telephone tinsel cordage:

Spiraflex **HANDSET CORDS** in bright colors with non-staining thermoplastic jackets in solid color extrusions matching color shade and sheen of telephone sets. Also non-staining black Neoprene jacketed cords. Both types available with or without integral moldings and terminations. Furnished in standard or extra long lengths.

STRAIGHT HANDSET AND DESK SET CORDS are available in non-staining thermoplastic constructions in matching colors and in black Neoprene.

GENERAL INSULATED WIRE WORKS, INC.

A DIVISION OF GENERAL CABLE CORPORATION
Providence 5, Rhode Island

General Company Transfers Curl from Cal. to Ohio

Glenn W. Curl of Manhattan Beach, Cal., has been named general equipment engineer of the General Telephone Co. of Ohio, according to an announcement made on July 6 by Clare E. Williams, company president.

In his new position, Mr. Curl will supervise the planning and designing of new central office equipment for service expansion and improvement throughout General's operating areas in Ohio.

G. W. CURL

Curl has been transferred to the Ohio company from Manhattan Beach where he was supervising engineer for the General Telephone Co. of California. His new headquarters will be at the company's executive offices in Marion, O. He will succeed Roy A. Worley, who recently retired from the company.

A native of California Mr. Curl pursued his undergraduate studies at the University of Southern California, and later completed specialized courses in communications engineering conducted by the General System.

Prior to his employment with General Telephone in 1950, he served three years in the United States Army.

Prize-Winning Annual Report

The Southwestern States Telephone Co., Brownwood, Tex., has received *Financial World's* "Merit Award" for distinguished achievement in annual reporting. The award cites the company's 1958 annual report to shareholders for its excellence. The Southwestern States company's annual report was selected for the award on the basis of content, design and typography from among 5,000 entries in *Financial World's* 19th annual report survey.

ALPHADUCT UNDERGROUND "B" SERVICE WIRE

ELIMINATES UNSIGHTLY OVERHEAD DROPS

PROVIDES EXTRA PAIR FOR SECOND PHONE

...and no other underground service wire can compare with Alphaduct for sheer ruggedness and trouble free service under unfavorable operating conditions. Alphaduct is engineered to withstand moisture, heat, abrasion, deformation and you get these PLUS FEATURES:

HIGH DIELECTRIC STRENGTH

HEAT STABILIZED POLYETHYLENE INSULATION

MINIMIZED CROSSTALK through control of side to side Capacitance Unbalance

ALUMINUM TAPED for electrical shielding against lightning and interference

CONDUCTORS—annealed copper covered steel for strength

AND IT'S DATED—simplifies your record keeping ...proves Alphaduct's durability

When you buy Alphaduct Underground "B" Service Wire, or any one of Alphaduct's different types of telephone wire—you buy the know-how of the recognized leader in the manufacture of insulated wires for the Independent Telephone Industry.

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WIRE AND CABLE CO.
NEW BRUNSWICK, N. J.
CHarter 9-8090

Regional Distributors
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Columbus, Ohio

The Lindsay Telephone Supply Co.
Cleveland, Ohio

Pankey Supply Co.
Charlottesville, Va.

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

THIS IS THE SEASON when people are planning vacations. There are many plans to be made in addition to where to go and what to do when you arrive.

An excellent vacation article appeared in the June issue of the Indiana *General News* suggesting a formula for fun and relaxation. The article stated to get the most out of your vacation, keep in mind these simple precautions:

Before You Leave—

Leave a key to the house with a neighbor for periodic inspection. Lock windows and doors. Give friends your itinerary and license number. Stop milk and newspaper deliveries.

Check utilities. Turn off gas at the meter. Remove fuse from all lights except those to be left on purposely. Check for leaky faucets.

Make sure appliances are turned off. If refrigerator is to be turned off, leave the door open to prevent mildew.

Allow plenty of time to pack. Don't forget blankets and pillows for traveling in the car, thermos jugs, or cooler bags, etc.

Take first aid kit, flashlight, sun glasses and flares. Have the car checked thoroughly, especially tires, brake lights.

On the Way—

Drive defensively—all the way—at a speed safe for road and weather conditions. Obey posted speed limits.

Stop driving the moment you feel sleepy. Change drivers frequently. Let your physical condition and the condition of the roads determine the number of miles you drive in a day—not your schedule.

If you are caught in a storm and lightning begins, stay with the car. The metal frame intercepts the lightning and the rubber tires provide insulation. Don't touch metal parts.

If you must stop beside a crowded highway at night, turn off lights and light a flare or wave a flashlight. Leaving lights on may cause another car to follow you.

Do not overload the trunk so you can't close the lid. This could permit carbon monoxide to creep into the back seat.

When You Get There—

Camping. Check on local hazards, such as snakes and poisonous plants; boil drinking water for a half hour if you're not sure of it; take care to extinguish campfire before leaving.

Boating. Don't overload your boat. See that everyone stays seated; provide a life preserver for each passenger. If the boat capsizes, use boat as life preserver until help arrives.

Swimming. Swim only in protected waters; never swim alone, never too far out, and never after dark; look carefully before you dive into strange waters.

General. When the heat's on, settle for less sun and less food. Remember to take it easy—don't try to crowd a year's exercise into several days. When it comes time to return home, give yourself plenty of time. Allow yourself a day or two at home before returning to work. If you don't try to do too much, and you do it safely, your vacation will pay off in fun, health, and a real rest.

The foregoing formula for fun is a comprehensive one and, if heeded, should result in a pleasant, safe, and relaxing vacation.

This year, some telephone folk may be planning a vacation to our new state—Alaska. If so, it is well to have some advance information about our new state.

In a letter received from Peg Allen, the acting secretary of The Last Frontier Chapter of The Independent Telephone Pioneer Association, we learned a little about Alaska.

In addition to its beauty, good fishing, etc., like all other states, it has its problems. For example, when Peg wrote to me on June 17, they were having forest fires, one road up, and one road down. If the roads are closed, it means tourists can't see much.

There is a big fire on Kenai, 3400 acres are on fire now. Kenai is the most scenic area, and Kenai Lake is supposed to be one of the most beautiful lakes in the world. The beauty of the area is destroyed for the time being, and the roads to the glacier are blocked because of it.

According to Peg (Mrs. Harve Allen), they have 300 men from the Army base, volunteers, special fighters from the states, fighting the fire, but so far, it burns merrily on its way.

They have also had a fire on the Army base for weeks. According to Peg, it looks strange seeing it smoke so furiously above the timber line, but it is said the tundra burns 6 or 7 feet down. New fires break out every day and everyone is hoping for a good hard rain.

Quoting from Peg's letter:

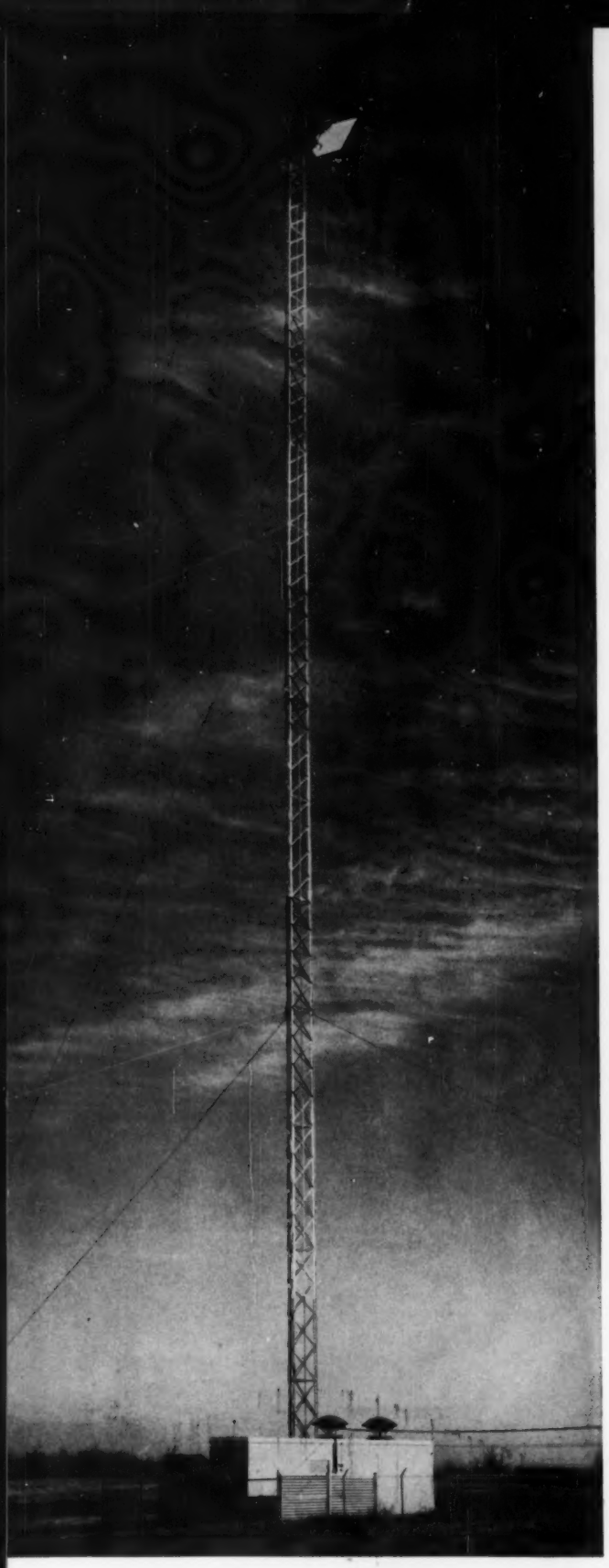
"Our weather is lovely, but it is still 'jacket' weather. One of the boys brought us a moose last night and it was the best I have ever eaten—so tender. I wondered if perhaps the animal wasn't quite young. Usually the meat is coarse-grained, but this looked like veal and was fork tender.

"We had a (moose) visitor in downtown Anchorage this week. The fire perhaps is disturbing the animals. A moose caused a major accident on one of the main streets. It didn't hurt the moose, but the car was a wreck."

This will be of interest if you are planning a vacation in Alaska. It is not possible to drive from one city to another, as we do in other states. Most tourists hope to visit Juneau, and it shocks them to find there are no roads. Most tourists assume there are roads, perhaps not hardtop but—

According to Peg, one of the hotels in Anchorage got a huge kick out of some California tourists who drove up for their vacation. When told of the road block, they checked out, loaded their car, then asked about the directions to Juneau. When told they would have to fly, they were so angry. The man said he could drive anywhere, and he would drive. The hotel is wondering what became of them. Probably, the ice fields between Anchorage and Juneau discouraged him.

(Please turn to page 55)



301-foot high guyed Microwave Tower will not sway more than ¼ degree nor twist more than ½ degree in 70 mph winds. Tower is guyed at three elevations, and supports an 8 by 12-foot Passive Reflector.

Blaw-Knox Tower Systems can ease your Microwave "growing pains"

In planning Microwave expansions many telephone companies have relied on the specialized engineering services of Blaw-Knox Microwave Tower Engineers.

These men are uniquely qualified to provide the right answers to questions that arise in connection with a Microwave system: Which type of tower is best suited for the specific site? Should the tower have built-in adaptability for future requirements? What inspections are necessary? And many others.

Blaw-Knox Engineers have accumulated over forty years experience in building towers for all types of communications systems and electric power transmission, as well as such complex structures as radio telescopes and antennas for tropospheric scatter propagation. These specialists are ready to assist you with practical know-how and design experience. Contact the tower and antenna group with your specific requirements.

Microwave Towers—Guyed and self-supporting towers for Microwave, AM, FM, TV, Radar, Communications . . . Transmission Towers . . . parabolic antennas . . . special structures.

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BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania

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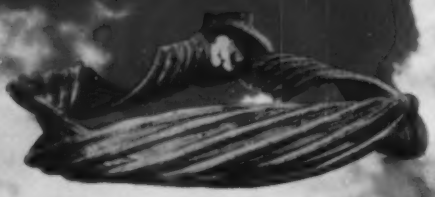
GUY-GRIP dead-ends

STANDARD LOOP



THE SAME

WITH A

NEW CABLED LOOP

FOR STRAND SIZES

5/16″

3/8″

7/16″

1/2″

MATERIALS

GALVANIZED STEEL
- Utility Grade
- High-Strength
- Extra-High-Strength

COPPERWELD
- Including the M Series

CALSUN BRONZE

ALUMINIZED STEEL

STAINLESS STEEL

ALUMOWELD

PATENTED — U. S. PATENT NUMBER 2,861,272 — MARK — "GUY-GRIP"

DEPENDABLE PRODUCT

NEW TWIST

GUY-GRIP dead-ends OFFER YOU:

1 More durable loop... just like the strand

2 Easier tensioning for down-guying & span guying

3 Smoother contouring... more adaptable for multiple guying

You can look up to Preformed™

PREFORMED LINE PRODUCTS CO.
DEPT. GG3
5349 St. Clair Avenue, Cleveland 3, Ohio

Write for the Preformed Booklet-of-the-month **"THE NEW TWIST"**

Queen's Trip Inaugurates Transatlantic TV Process

The international telephone cable between the British Isles and North America and a new facsimile process made it possible for United States television viewers to watch the departure of Queen Elizabeth II from London on her visits to Canada and the U. S. on June 18, only 2 hours and 21 minutes after it occurred.

A close-up was said to have had surprisingly good quality and stability for this first telecast over the transatlantic cable.

Prior to this, motion pictures had to be shipped over the Atlantic by jet airplane, involving a lag of approximately 8 hours between the event and its screening. Through this new process, viewers were able to watch at 10:27 am, something that occurred 3,000 miles away at 8:06 am.

The British Broadcasting Corp. developed the method of "motion picture facsimile" and made the TV film that was transferred electronically to the cable.

In Montreal, the signals were used to reassemble a duplicate film, which in turn, was then televised over the networks of the National Broadcasting Co. and the Canadian Broadcasting Corp.

In all, approximately 2 minutes and 5 seconds of film were transmitted over the cable. It is the transatlantic cable which made this long-distance transmission possible. It is regularly used for sound broadcasts but there were no facilities for transmitting live television pictures across the Atlantic either by cable or by radio.

When the new cable, which runs under water between Newfoundland and Scotland was opened on Sept. 25, 1956, it was thought that it might be employed for TV but the possibility was considered to be remote because of the problem of channel width.

In electronics, a channel can be likened to a road over which broadcasting signals pass. The width of the road is measured in terms of cycles per second.

In the United States, a television station uses a picture channel that is 4 million cycles wide. In Great Britain it is 3 million cycles.

But a telephone circuit does not need such a wide channel. Therefore to use the cable, British engineers succeeded in compressing a usable moving image into a channel of 4,500 cycles.

Under the BBC method, every other picture, or frame, in the original film is transmitted over the cable at a relatively slow rate—one picture every 8 seconds.

On the receiving end, the duplicate film is then run off at normal speed.

A film running one minute on the home screen takes 100 minutes to send over the cable. The speed of transmission of each film frame is about 75 times faster than previous methods of sending still pictures by facsimile transmission.

The new process employs a slow-speed flying-spot film scanner, the video signal from which is used to modulate a carrier for transmission over the cable.

At the receiving end, the signals are demodulated and used to operate slow-speed film telerecording equipment.

The BBC emphasized that this system has only a limited application at present, but that it is a step toward international live TV.

The evening of June 18, the cable was used to relay a film of the Queen's arrival at St. John's Newfoundland, to viewers in Britain.

The Newfoundland arrival film also marked the first public transmission of television pictures over the new 524-mile-long microwave radio system linking St. Johns to Sidney, Nova Scotia and thence to the rest of North America.

Supplied by Standard Telephones & Cables Ltd., an affiliate of International Telephone & Telegraph Corp., the system includes what is believed to be the world's longest over-water microwave link, a 70-mile path across Cabot Strait between Nova Scotia and Newfoundland.

The microwave chain of 23 stations provides 600 two-way telephone circuits apart from its capacity to carry TV pictures in either direction.

The Queen's arrival in Chicago on July 6 inaugurated the first TV images to be transmitted from the United States to Britain over the transatlantic cable. British viewers did not see a "live" or instantaneous account of the Chicago visit but they viewed Her Majesty on film about an hour after TV cameras recorded her actions in Chicago.

Let Mind Expand

"Instruction enlarges the natural powers of the mind."—HORACE.

CHANGE

TO THE CASHIER, it means pennies, nickels, dimes and quarters.

TO THE PARENT, it means things were different when I was young.

TO THE ELDER STATESMAN, a new map of the world.

TO THE COLLEGE GAL, back into something more comfortable.

but to ALLEGHENY AIRLINES it means a new telephone number ....

.... After June 23rd, please call us:

In NEW YORK at PEnnsylvania 6-3200

In NEWARK at Mitchell 2-7900

FOR INFORMATION AND RESERVATIONS

Or at Mitchell 3-3888

FOR AIR CARGO INFORMATION OR PICK-UP

You'll find the same group of experts ready and able to help you with your travel and air shipping needs . . . at the same location . . . 625 Fifth Avenue. But with expanded facilities to serve you even better than in the past.

Fastest, most frequent service to:

WILKES-BARRE AND SCRANTON, BRADFORD, JAMESTOWN, ERIE, LANCASTER AND HARRISBURG.

Fly on . . . Rely on ALLEGHENY AIRLINES

The problem familiar to both telephone companies and business subscribers—changing telephone numbers necessitated by conversions—has been handled effectively in this number-change announcement to its customers by Allegheny Airlines. Perhaps there's an idea here that could be passed on to business subscribers who receive a large proportion of their business over the telephone.

NOMINAL WEIGHTS OF FINISHED WEATHER-RESISTANT WIRE AND CABLE

(Pounds per 1000 Feet)

Conductor Size AWG or Mcm	Copper & Copper Alloy Conductors: URC Type Double Braid	URC Type Triple Braid	Neoprene Type	Polyethylene Type	Aluminum Conductors: Neoprene Type	Polyethylene Type
Stranded						
2	246	270	248	**230**	105	**87.4**
4	155	170	163	**143**	73.3	**53.3**
6	103	115	108	**91.5**	51.5	**35.0**
Solid						
2	239	260	232	**219**	92.2	**79.2**
4	151	164	152	**136**	64.0	**48.0**
6	100	112	101	**87**	45.7	**31.7**

Sources: American Standards Association Specifications

This table shows

POLYETHYLENE covered line wire weighs less

Because it's the lightest, polyethylene-covered line wire is the easiest for linemen to string up . . . hardest for ice and snow loading, gale-force winds to bring down.

Polyethylene-covered line wire, depending on size and conductor, weighs from 5% to 32% less than other types. That's what the figures in the specifications tabulated above show.

This, of course, is no news to linemen who have strung all types of weatherproof line wire. They may not be able to quote pounds and percentages, but they all know you can't beat polyethylene on weight.

Linemen's Favorite Material

Light weight means easy handling, one of the main reasons polyethylene rates tops with installation crews. They also like polyethylene wire because it's clean . . . free-stripping . . . has a smooth, self-lubricating surface that almost makes pulling a pleasure. And despite the exterior slip, the plastic covering hugs the conductor tightly, doesn't ruffle as it goes over crossarms.

"Built-in" Safety Factor

Polyethylene's lightness provides lasting mechanical advantages, since span loads don't tax supports as much as heavier type wire. This "built-in" weight safety factor pays off when violent storms push aerial construction to strain limits . . . when ice and snow loads topple heavier lines.

An added factor in polyethylene wire's ability to stay up under adverse conditions is its smaller diameter. It offers less resistance to wind, a smaller surface for ice build-up.

Winning Combination

Called the "closest to the ideal covering for line wire," polyethylene is outstanding in other respects too. The shield it forms over wire is continuous . . . tough . . . resistant to aging, weathering, moisture, abrasion by lashing branches. It's good for decades of superior service marked by fewer outages, minimum maintenance.

When you order covered wire and cable, make sure the coating is made with PETROTHENE® polyethylene resins. PETROTHENE polyethylene costs no more, but it gives you premium weather and stress-crack resistance.

Polyethylene's advantages are outlined in an informative new U.S.I. data sheet, "Polyethylene . . . The Best Line Wire Covering." Also available is a data sheet showing properties, applications and specifications of PETROTHENE polyethylene compounds. Send for your copies today.

U. S. Industrial Chemicals Co.
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Please send me:
- ☐ "Polyethylene . . . The Best Line Wire Covering"
- ☐ "PETROTHENE Resins for the Wire and Cable Industry"

Name:_____ Title:_____

Company:_____

Address:_____

City:_____ State:_____

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Here's a forecast you can count on: It's always fair weather when you buy construction materials and supplies from Stromberg-Carlson.

We have strategic "good weather stations" spotted around the country, and there's one near you. No high-pressure system can develop with our "meteorologists" on the job—just quality supplies from reputable makers, and personalized service from experts.

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that blows good!

We are always glad to serve your smallest need and happy to keep a weather eye out for your future requirements. So stay with the XY® front and be sure of fair breezes and cloudless skies!

Gerald Gaydos is one of our barometer watchers at our Chicago "good weather station."

THE OPERATOR'S CORNER

Continued from page 48

A word to the wise is sufficient. Before taking off for Alaska, secure the necessary information, mode of travel, hotel facilities, etc. Your vacation can then be an enjoyable one in our 49th state.

Traffic Questions

(1) If the information operator has been unable to give an acceptable report at the end of approximately 3 minutes, how should she proceed?

(2) If a subscriber asks the information operator to recommend a business concern in preference to another business concern, should the operator comply with his request?

(3) When an information operator gives a report, if the report is not understood, how often should the report be repeated?

(4) If a subscriber asks the information operator to make a choice in giving him a telephone number, where there is more than one listing which may be the one he desires or may serve his purpose, should the information operator do so?

(5) If a subscriber asks the information operator to connect him with a number, what should the information operator say?

(Answers are presented on page 76.)

Lt. Gen. O'Connell Becomes GT&E Research Consultant

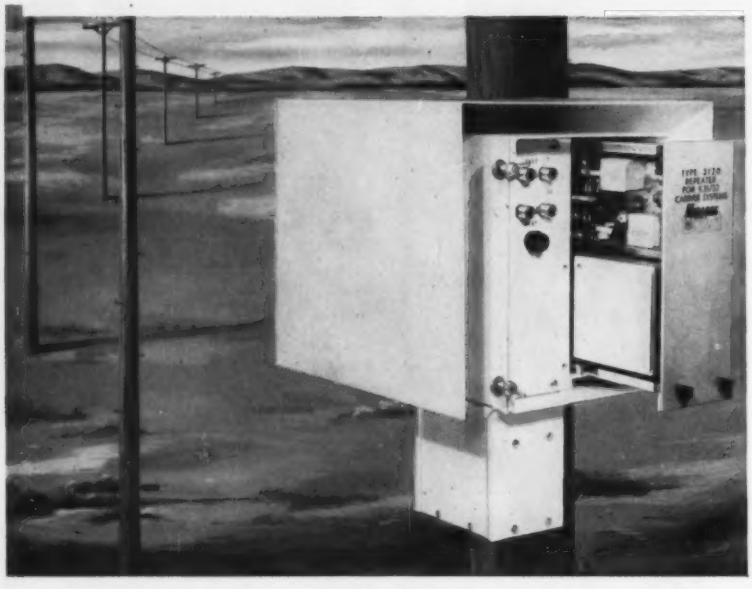
Lt. Gen. James D. O'Connell, who recently retired from the post of chief signal officer, U. S. Army, has become a consultant to General Telephone & Electronics Corp., it was announced on July 1 by Donald C. Power, chairman and chief executive officer of the company.

General O'Connell will undertake a comprehensive study of the research and development personnel and facilities of the entire organization, Mr. Power said. The objective of the study will be to aid in "evolving a program for maximum utilization of the company's technical resources and capabilities, to assure a continued flow of new ideas and advanced concepts throughout the organization," he explained.

Mr. Power pointed out that one of the major reasons for undertaking the study was the recent merger which resulted in Sylvania Electric Products Inc. becoming a subsidiary of General Telephone & Electronics Corp.

"The research and development work being performed by the over-all General Telephone & Electronics organization

K-31
with the new
Kellogg Repeater
doubles
Carrier System Mileage!



The only system offering a Repeater

· *Check these advantages:*

- ☑ Kellogg's exclusive new repeater *doubles* the mileage you get from your K-31 carrier system.
- ☑ Two repeaters *triple* your carrier mileage.
- ☑ And Kellogg repeaters are surprisingly low in cost!
- ☑ Kellogg Carrier offers more exclusive features than any other system on the market (see facing page).
- ☑ Kellogg's low price is complete, "no extras."

That's why you'll find Kellogg K-31 Rural Subscriber Carrier being installed by more and more independents across the country.

For more details on Kellogg Carrier see our ad on the facing page, then . . . call Kellogg for complete information.

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CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company
6650 South Cicero Avenue, Chicago 38, Ill.
Communications Division of International Telephone and Telegraph Corporation.

See pages 6-7 for list of Kellogg offices

LT. GEN. J. D. O'CONNELL

represents the expenditure of more than 20 million dollars annually, exclusive of numerous projects being performed for the government," he said. "Nearly 3,000 scientists and engineers are engaged in a wide variety of projects in 23 laboratories throughout the country."

"Complementing the activities of the General Telephone Laboratories, Sylvania's research and development work is a source of substantial know-how in electronic research and development, which should prove of major importance in the telephone and communications fields generally. This should enable the over-all organization to provide better communications service to the public and to serve more effectively the national defense effort, as well as continuing to introduce new and improved products in the industrial, commercial, and consumer markets," Mr. Power commented.

A native of Chicago, Ill., General O'Connell was graduated from the U. S. Military Academy in 1922. In subsequent years prior to World War II, he served in various assignments in the continental U. S. and in Hawaii. After serving as an instructor at the Signal School in 1928-29, he entered Yale University and received his master of science degree in 1930.

He then returned to the Signal School faculty, and the following year entered the Command and General Staff School, from which he was graduated in 1937. Immediately prior to the war, he served in major posts at the Signal Corps Laboratories, Fort Monmouth, N. J.

During World War II, General O'Connell served first in the office of the chief signal officer, and then with the Signal section of the 12th Army Group overseas. After the war, he served successively as director of the Signal Corps Engineering Laboratories,

signal officer of the Eight Army in Japan, and in several other key assignments in the U. S. He was named deputy chief signal officer in 1951, and chief signal officer four years later, subsequently being promoted to the rank of Lieutenant General, which represented the first time this rank was attained by a chief signal officer. He retired on Apr. 30.

General O'Connell holds the distinguished service medal, the legion of merit with oak leaf cluster, and campaign medals for his World War II service.

The GT&E research and development facilities include laboratories at Bayside, L. I., N. Y., performing basic and applied research in the fields of physical electronics, solid-state physics, electroluminescence, systems and circuits, chemistry, and metallurgy.

Nine laboratories located throughout the country are concentrating on research and development work in such highly advanced areas of national defense as countermeasures and countercountermeasures, data processing systems and computers, communications, navigation, radar, and others.

Other laboratories are engaged in a variety of research projects which are directed toward improvements in communications services, new product developments, and product improvements in the fields of telephony, lighting, electronic tubes, home electronics, photographic equipment, semiconductor devices, chemical and metallurgical materials, and various types of components.

More Capital Allocation Urged for U. K. Conversions

A plea for greater capital investment by the post office, so that the United Kingdom's progress with its internal telecommunication system can be speeded up, is made by the Telecommunication Engineering & Manufacturing Association in its annual report for 1958-59, published on June 15.

The association expects that 30 years will elapse before the finalization of the changeover of the country's exchanges from manual to automatic.

"It is revealing," the report states, "to compare the planning of conversions in the United Kingdom, where it is expected that 75 per cent will have been completed by 1970, with West Germany where there are expectations of 80 per cent conversion in the early sixties, and with at least two countries in Europe, where conversion has already been substantially completed."

A survey of the 15 countries, the report indicates, which have more than

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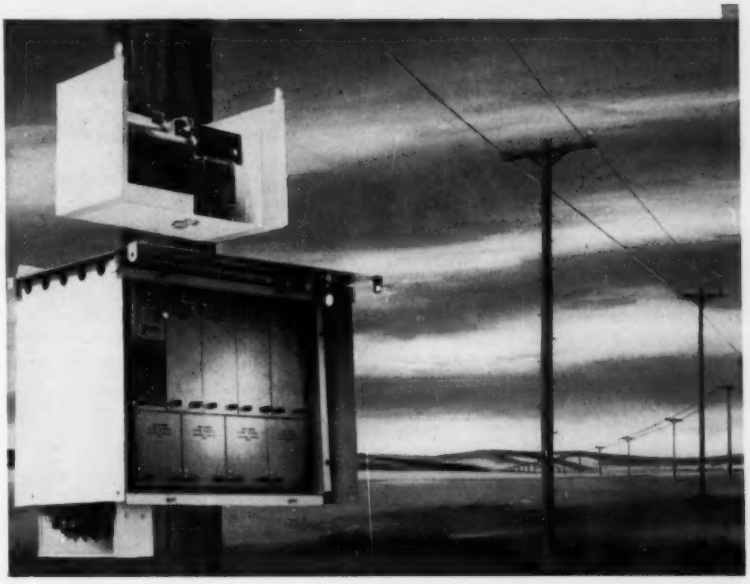
offers all these features

At Lower Cost

than any other

Carrier System!



☑ *Built-In Stand-By Power* as standard equipment! Sufficient to operate 4 channels for 12 hours if commercial power fails.

☑ *Built-In Compandors!* Reduce line noise and cross-talk on open wire line so that circuits meet transmission standards.

☑ *Automatic Regulation!* Maintains constant output level regardless of line loss variation due to changing weather conditions.

☑ *Completely Transistorized!* Including power supply! Guarantees steady toll quality performance.

Best of all, the low cost of the complete systems, "no extras," will enable you to prove it even on short distances.

Call Kellogg . . . and get full details on telephony's *most effective and economical* carrier system.

DON'T FORGET, only one relay is required for each terminal of Kellogg's K-32 Trunk Line Carrier.

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See pages 6-7 for list of Kellogg offices

one million telephones show that the United Kingdom is lagging behind in development.

It was also reported that "while paying tribute to 'one of the liveliest and most effective postmasters-general which this country has seen for years,' the TE&M Association complained that the post office has been treated as the 'Cinderella' of the nationalized industries in terms of capital allocation.

"Despite a long waiting list for telephones," the report concludes,—"it will be reduced by a mere 30,000 to 137,000 by the end of next year—gross fixed investment by the post office in 1959-60 shows a decrease of 7 per cent over 1956-57; while the other nationalized industries show pronounced increases up to 120 per cent."

N. Y. Company Honors Service Records of Top Executives

At a special luncheon meeting for the entire management group of Orange County Telephone Co., Middletown, N.Y., on June 19, the president, Charles C. Chappell and executive vice president, Frank D. Fancher, were surprised with the presentation of service certificates and transistor clocks.

Lee I. Hunt, center, secretary and general manager of the Orange County Telephone Co., presents service certificates and gifts to Charles C. Chappell, president (left), and Frank D. Fancher, executive vice president. Mr. Chappell has served the company 48 years, Mr. Fancher nearly 51 years.

Mr. Chappell, with nearly 48 years of service with the company, is now serving his 28th consecutive term as president and general counsel. A graduate of the Albany Law School, he was admitted to the bar on Nov. 13, 1906, and shortly thereafter engaged in private law practice in Goshen, N. Y.

His first association with the Orange County company began on Mar. 1, 1912, when he was appointed attorney for the company.

On Jan. 18, 1917, he was elected assistant secretary and attorney, and one year later, was elevated to vice president and attorney.

Following the death of Dr. Edwin Fancher, founder of the company, Mr. Chappell was elected president and general counsel on Dec. 8, 1931, and has served in this capacity ever since.

Frank D. Fancher, executive vice president and treasurer, started his career with the company on Dec. 9, 1908.

Following his graduation from Pratt Institute, he worked for the New York Telephone Co. and the Western Electric Co. for a short period.

In December, 1931, Mr. Fancher was elected vice president, treasurer, and general manager and on March 1 of this year was promoted to executive vice president. His total service record amounts to nearly 51 years of continuous association with the telephone industry.

Mr. Fancher has the distinction of being one of the two living charter members still serving on the Board of Directors of the New York State Telephone Association, and was reelected for his thirty-ninth consecutive term during the Annual Convention held on June 15.

Pakistan-Hong Kong Link

The Pakistan Posts & Telegraphs Department has opened direct radiotelephone service between its capital, Karachi, and Hong Kong, it was reported on July 2.

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Fully color coded with all pairs guaranteed.

Inner polyethylene jacket for mechanical and electrical protection.

Longitudinal copper shield corrugated on large diameter cables for flexibility.

5 mil copper tape on standard cable.

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THE PLASTIC WIRE & CABLE CORPORATION

JEWETT CITY, CONN.

NEW YORK CONVENTION

Continued from page 34

plication of the switchboard-operator exemption to those having exchanges in their own homes.

Mr. Barnhart stated, "Senator Kennedy's Labor Subcommittee has started hearings . . . Electrical Workers of America's Joe Byrnes appeared and insisted on the $1.25 minimum and elimination of all exemptions, saying that any telephone company that could not pay $1.25 an hour should not be in business.

"Clyde McFarlin of Iowa, chairman of our Employment Relations Committee, testified in behalf of the small exchanges and made a strong appeal for the salvation of the little fellow.

"The USITA will continue to vigorously oppose any change in this act. Meanwhile, we urgently advise you telephone people to talk to your Senators and Congressmen and do it now. We cannot predict what will happen in this session of Congress. But we do know that in some future Congress this act is bound to be repealed. So the only safe course for all of you who have manually-operated exchanges is to convert to dial."

Benjamin H. Oliver Jr. of Albany, vice president—upstate, New York Telephone Co., discussing "The Future Telephone Number," told of the evolution to neutral (not related to local geography) exchange names with two letters and five numbers (for example: PI lgrim 7-9970). He said, "We had not embarked on this numbering plan arrangement for very long before we began to notice that our customers were not using the full name on all occasions. For instance, instead of saying Pilgrim 7 some started saying PI 7.

"Next we began noticing that advertisements were not publishing central office names either. They were using PI 7 more often than Pilgrim 7. In fact in one recent survey we made it was found that this was so in 85 per cent of the cases. They told us it was not a case of saving space but preventing confusion. For example, AXminster 7 is quite different from BUckminster 7, but some people confused the two because each had a 'minster' ending."

Mr. Oliver reported further customer surveys showed that when an information operator in response to a query gave out a number like Spring 7-9970, the customer repeated SP 7-9970 from 5 to 20 per cent of the time. He went on:

"This knowledge gave us courage to experiment further. We instructed a

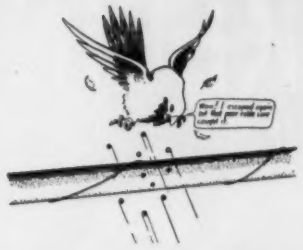
HAVING TROUBLE WITH OPENS?

Solve them quickly, with a Neale Troubleshooter's tone and the "Cable Trouble Shooting" booklet.

The Neale Troubleshooter's tone is an inexpensive, easy to use instrument, for talking and locating trouble in telephone cable.

The tone has circuits for high and low frequency testing, a circuit for talking, and a buzzer circuit for testing continuity.

It comes complete with batteries and four leads, all contained in a strong case



with an over-the-shoulder leather carrying strap. It weighs only 9 pounds with batteries.

JUST OFF THE PRESS: The Cable Trouble Shooting booklet has ten trouble shooting circuits, written and illustrated so the layman can understand them. We will be happy to send you a FREE copy of this booklet; just write to address below.

CABLE SPINNING EQUIPMENT CO.

3100 TOPEKA AVE.
TOPEKA, KANSAS

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...a NEW LINE of fully automatic silicon battery chargers by...

ACME

- NEWEST CIRCUITRY OF PROVEN DESIGN
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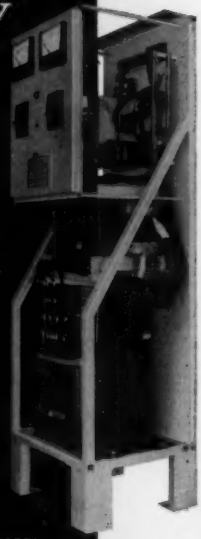

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25 AMPERES
AT 129 VOLTS

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The name Klein on leather goods is known and preferred by linemen and electricians everywhere. Klein tool belts, safety straps, pouches and pockets represent the highest in quality, the safest in design and construction.

In safety straps, Klein-Kord was the first specially woven fabric strap designed to permit the use of a tongue-type buckle without risk of slitting or ripping, even under severe strain.

Now Nylon Klein-Kord safety straps are the newest Klein development offering maximum safety with maximum flexibility. These are the only nylon straps designed to meet the tests given in Edison Electric Institute Report AP-2.

Free Tool Guide

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half dozen information bureaus to give out telephone numbers on a PI 7 basis instead of the more traditional Pilgrim 7 manner.

"By this time we were not too surprised at the result. Most people didn't even raise an eyebrow at our departure from the standard. In some information bureaus only ½ per cent of our customers commented on the change in procedure . . . We gave out 18,000 numbers in this way at one bureau with only one single criticism."

Mr. Oliver continued: "A further refinement of this number scheme came to mind when we asked ourselves, 'What is the best set of letters that we can use?' If we can find these and they are difficult to confuse with one another, or with numbers, maybe we will have a more trouble-free arrangement than ever. This is what we came up with:

Dial Pull:	2	3	4	5	6	7	8	9
Letter:	A	F	H	L	N	R	T	X

"These letters are phonetically strong and less likely to be confused one with the other. Neither '0' or 'I' are employed since for years these have been getting mixed up with zero and one.

ACademy 2 becomes AA2
ORange 7 becomes NR7
ULster 3 becomes TL3"

Manhattan has not gone as far as the eight-selected-letter plan Mr. Oliver discussed. The reason is that New York Telephone doesn't want to inconvenience the many customers in Manhattan with a number change when one is not really required.

However, he said, in Buffalo, where telephone numbers are still not on a 2-5 numbering basis, the company does have to change some numbers so customers can be made ready to go on the Direct Distance Dialing network. In October, New York Telephone will make a trial in eight suburban offices of the new numbering scheme, using the eight selected letters listed above.

Incidentally, Mr. Oliver said, Wichita Falls, Tex., is making a trial of an all-number numbering arrangement.

James A. Lundy's talk, "Public Utilities in the State's Economy," was a discussion, in broad terms, of ways to strengthen that economy. He said he is in full accord with the governor's plans to operate with fiscal responsibility and halt the trend toward mounting deficit financing. He continued:

"In my view, public utility companies are the sinews of the state's economy and they are therefore vital in any program for the economic well-being of our people.

"It is elementary in the economic primer that enterprise seeking areas for productive investment weighs carefully certain basic factors: (1) a sound tax structure; (2) availability and quality of manpower, and (3) adequate power, transportation and communications facilities at reasonable costs.

"Gentlemen, point 3 is where you and the commission come in.

"There are other conditions that the experienced investor, the business promoter or manufacturer looks for but none exceeds in importance the question of the type and quality of the utilities in the locale in which he contemplates business or industrial activity. He needs reliable sources of power, adequate transportation, and high grade communications systems.

"I am no stranger to the actualities of public utility operations and I am happy to be in a position to say, from first-hand knowledge, that New York state is fortunate in having a network of utilities of all types which provide excellent service."

Mr. Lundy emphasized the crucial role of telephone companies in the broad objectives of the state's economic program. Enlarging on this, he said, "A prosperous consuming public is necessary for the prosperity and expansion of our utility industries, and, in turn, the utilities are indispensable to the economic well-being of the community.

"Strong and well-managed utilities providing adequate service at reasonable rates are a powerful inducement for the expansion of existing business and for the attraction of new enterprise to the community.

"On the other hand, adequate and efficient utility services can be provided only by a vigorous and healthy industry, able to expand in accordance with public needs, having the incentive to develop better and cheaper methods of supplying service and receiving in return sufficient earnings to assure continued effective operation. Thus, the welfare of each depends upon the other.

"To put it another way, there is an interdependence between the economy of public utility companies and unregulated business and industry. A proper coordination of the interests of both, encouraged by sound government policies, will create a favorable climate for employment and business opportunities.

"Insofar as the public service commission is concerned, it will exercise its powers and will direct its energies to further the interests of the utility companies under its jurisdiction to the end that the common interests of the community as a whole will be served best."

Referring to telephone industry people, the Rev. Colin F. Miller, dean of the college chapel, Hamilton College, Clinton, N. Y., in his talk, stated, "You men and your techniques are perhaps more responsible than any for drawing the world together into what is more and more one world."

He said he agreed with President Eisenhower's evaluation of the gravity of the need to avoid global war. Ike had said, "There is no alternative to peace."

Reverend Miller remarked that the English people—who presently have their backs to a wall at which six thermonuclear bombs could obliterate the British Isles—admire Americans for their adaptability. He cited an example from the Korean War, during which the British set up special training courses in night fighting, whereas the United States developed the star shell which turned night into day on battlefields where they were used.

The greatness of the Victorian era, Reverend Miller observed, lay in its writers and thinkers concerning themselves overwhelmingly with: What is right? He said that today man "bats his brains out" asking questions we weren't meant to ask such as: What is safe? How do I gain security? What is the most convenient thing to do? Reverend Miller stated that the only question that will save us is: What is right?

The convention re-elected the following:

For two-year terms:

Sheldon A. Birdsall of Margaretville; C. Ray Lloyd of Manlius, and Robert Maytum of Fredonia.

For one-year terms:

Frank D. Fancher of Middletown; C. E. McCormick of Johnstown; William A. Seely of Norwich, and Albert N. Seward of Jamestown.

Returning to service on the board after an absence of two years is William A. Kern of Rochester. He was elected to a one-year term.

Other directors are: George S. Beckwith of Keeseville; Fred S. Florance of Monroe, and Don W. Walker of Newark.

The directors elected the following officers: President, Mr. Seward; vice president, Mr. McCormick; secretary-asst. treas., Mr. Beckwith; treasurer, W. Malcolm Griswold of Phelps, and executive secretary, Hamilton A. Cunningham of Albany.

Give Spare Time to Red Cross

The Red Cross campaign slogan—"People need Red Cross—Red Cross needs people"—is as vital today as ever. People are needed who are willing to give spare time to:

(1) Serve as family welfare aides.
(2) Care for hospitalized veterans and servicemen.
(3) Provide aid for disaster victims and their families.
(4) Teach community health and safety classes.

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The SERIES S-X SERVICE BODY features both front and rear VERTICAL door arrangement to utilize every inch of Body space.

The design of the SERIES S-X Compartment layout purposely encourages the storage of heavy material ahead of rear axle and lighter equipment in the rear. Rear vertical compartments are supplied with hooks to provide hanging of ropes, belts, and climbers. Horizontal and front vertical compartments contain material shelves, parts bins, and adjustable trays for storage of heavier tools and supplies on top of and ahead of rear axle. SERIES S-X SERVICE BODY provides three or more large compartments completely eliminating small, useless catch-all compartments or deep wells.

OUTSTANDING FEATURES INCLUDE:

- **Double mouldings around all door openings providing doors with triple sealing action keeping compartments water tight.**
- **Rub Rail to protect sides of body.**
- **Drip mouldings above all doors.**
- **Chains supplied so that horizontal door provides a horizontal work table when open.**
- **Precise workmanship and careful finishing result in equipment on which you are proud to display your name.**

Tell us your problems. Utility Body's Custom Design Service solves them by building to your requirements without additional cost.

COMPLETE LINE

There IS a UTILITY BODY to fulfill YOUR OWN Specific Requirements! Contact UTILITY BODY COMPANY for data on the SERIES S-X SERVICE BODIES or telephone your nearest distributor for complete information on UTILITY BODIES.

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Unsolicited performance reports from actual users state that POW-R-SPADE narrow trenches cost only 1 cent to 3 cents per foot, *including labor.* (Many report much less than 1 cent per foot.) Digging speed varies from 1½ ft. to 17 ft. per minute depending on soil conditions. POW-R-SPADE is light, rugged, with minimum of maintenance. Shipped *completely* assembled. Neat, fast, professional trenches—3 in. wide to 24 in. deep, or 4 in. wide to 18 in. deep Send coupon today.

One man can transport from job to job.

Stampings, Inc., 321—24th St., Rock Island, Ill.
Please send literature on POW-R-SPADE:

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COMPANY

STREET

CITY STATE

V. B. Flynn of Toronto, left, chairman of the Ontario Telephone Authority, discusses the program at the 49th annual conference of the Western Counties Independent Telephone Association with (left to right): W. P. Stokesberry of the United States Rural Electrification Administration and newly-elected President A. H. Brown of Byron, Ontario, and Fred R. Taylor of Belmont, honorary president.

Western Ontario Companies Hold Meeting, Elect Officers

Alex H. Brown, manager of the Byron (Ontario) Telephone Co. was elected president of the Western Counties Independent Telephone Association which held its 49th annual conference on June 10 in London, Ontario, Canada.

Nearly 200 delegates representing about 100 companies in Western Ontario attended the meeting presided over by Fred R. Taylor of Belmont.

Other officers elected are C. E. Janes of Watford and Mr. Taylor, honorary presidents; Robert Risdon of Thorndale, first vice president; Roy Sweetman of Essex, second vice president, and H. J. Schmidt of Baden, secretary-treasurer.

The theme of the convention was "Convert to Dial." Mr. Brown said in his talk, "Independent Telephone Company Financing," that Ontario Independent companies must either convert to automatic systems or die out.

The purpose of the conference, Mr. Brown said, was to urge companies to modernize. He stated that in western Ontario about 40 per cent of the exchanges have been converted to automatic operation.

More than 150 companies have disappeared in the past 10 years and in the next 10 years there will be only 100 rural companies left in the province, according to Vincent W. Flynn of the Ontario Telephone Authority, who spoke on "Problems Facing the Independent Telephone Industry."

Presently there are 350 systems in Ontario with western Ontario having more than any other region in the province.

Guest speaker (on "Building Dial Plant for the Future") was W. P. Stokesberry, an engineer for the Rural Electrification Administration, Washington, D. C.

Dial conversion and other modernization programs are proceeding rapidly in the U. S., he reported. But, he said, about half of the companies in the United States still use the old magneto-type telephone.

Mr. Stokesberry also told the conference that there is a strong trend towards telephone installations in cars and trucks in rural sections of the U. S.

"Telephone Safety" was the subject of a talk by Roy Bieth, manager Electrical Utilities Safety Association.

A resolution endorsing the actions of the Canadian Independent Telephone Association's (CITA) toll compensation committee, in negotiating for increased toll compensation for Independent companies with the Bell Telephone Co. of Canada, was supported by delegates.

The delegates also backed the following resolutions:

Requesting the CITA to continue negotiations in connection with loans to Independent companies.

Instructing the association executive to continue annual schools for plant employes and secretaries and set up a new training school for supervisory operators.

Eckley Heads Personnel, Public Relations for AT&T

Frederick R. Eckley, an assistant vice president of the American Telephone & Telegraph Co., has been appointed director of personnel and public relations for AT&T's Long Lines Department, effective July 15.

Mr. Eckley, who has been with the Bell System since 1936, is a graduate of Ohio State University and a native Ohioan.

During his career he has had a number of assignments in the general department of AT&T, and the New Jer-

F. R. ECKLEY

sey and Northwestern Bell Telephone Co.'s. For the past year, he has served in the AT&T operations department.

Three other changes were also made effective July 15. Assistant Vice President George F. Sparks, now in charge of the Long Lines personnel department, is to succeed John E. Waidlich as head of public relations. Assistant Vice President W. J. Whittaker will replace Mr. Sparks as head of personnel, while Mr. Waidlich will take over Mr. Whittaker's duties as head of the building and office service department.

All three men will report to Mr. Eckley, along with C. F. Nelson, assistant vice president in charge of regulatory matters.

Time-saving, trouble-saving tips on

Anchoring Lines, Equipment to Plaster or Masonry...

... in this pocket-size handbook by RAWLPLUG, the telephone industry's authority on masonry anchoring. Tells how to fasten cable straps, conduit hangers and instruments *securely* to solid or hollow walls with economical, quickly installed masonry anchors and hand or power drills.

- How to anchor telephone installations without hole-spotting
- Fastening methods that don't crack plaster or concrete
- Selecting screw, anchor, and drill sizes
- Converting your present drill to a power hammer
- And many other facts to save time and money anchoring telephone equipment to plaster or masonry.

For your **FREE COPY** of this "Masonry Anchoring Handbook," ask your Rawlplug branch or

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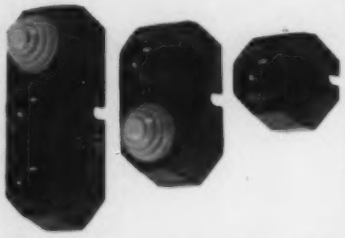
230 Petersville Road, New Rochelle, N. Y.

WHAT'S NEW AT

SUTTLE

TOP VALUES



New "All Purpose" Indicator Lights

For use wherever a visual signal is needed. Manufactured by SUTTLE, these lights are used in offices, hospitals, factories, mills, residences, etc. Order a sample set today from SUTTLE or your local distributor to show your subscribers. Order in any combination of white, ruby or green.

	Each
SE 15 Indicator Light (1 lamp)	$2.30
SE 17 Indicator Light (2 lamps)	$3.80
SE 18 Indicator Light (3 lamps)	$4.70

4-Point Blocks and Plastic Covers

Only SUTTLE mfg's. the independent industry's standard four-terminal connecting block with non-shorting plastic covers. Available in brown, black or ivory. Covers are high dielectric plastic—completely shorting resistant. For fast delivery of connecting blocks and covers, send your orders today to SUTTLE, or your local distributor.

SE 42A — $.36 each.

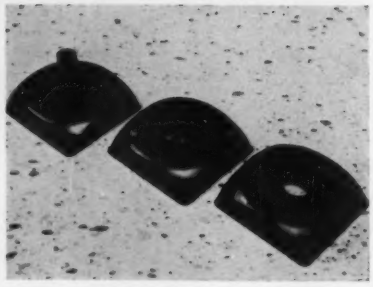
SUTTLE EQUIPMENT CORP.

401 N. 15th St., Lawrenceville, Ill.
Phone: Lawrenceville 782
135 S. La Salle St., Chicago 3, Ill.
Phone: DEarborn 2-3108

News on New Products

WIRE MOLDING—Flexiduct part No. 345, a universal fitting, has been announced by Winders & Geist, Inc., manufacturers of rubber over-the-floor wire molding. Flexiduct No. 345 consists of six parts: a metal base plate with knockout for under-floor input, a box 4 inches square and 1 inch high, a riser and a plug.

The box, according to Winders & Geist, fastens to the base plate with two self-tapping screws. The riser and plug are interchangeable. Flexiduct No. 345 accommodates either No. 1 or No. 2 Flexiduct with ¼ inch overlap.



This new part, according to the company, can serve as a terminal box, riser, ell, tee, cross, under-floor input, or as a combination of all of these uses. By removing both plug and riser, it can serve as an overhead input. Each complete unit is packed in its own carton. Instructions are included with each unit.

The units are packed 25 units to a carton. Request NP1139.

•

ELECTRICAL SHIELDING TAPE—"Metalshield," a new electrical shielding tape, has been developed by the Dobeckmun Co., a division of the Dow Chemical Co.

This tape is a combination of .00035-inch aluminum foil and .0005-inch Mylar, DuPont's polyester film. It is said to be not only more effective than other shielding materials such as braided

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP1139_____; NP1140_____; NP1141_____; NP1142_____;

NP1143_____; NP1144_____; NP1145_____; NP1146_____;

NP1147_____; NP1148_____; NP1149_____; NP1150_____;

NP1151_____.

Name.....

Company.....

Street.....

Town and State.....

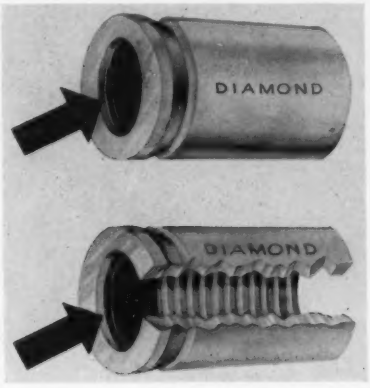
7/18/59

copper wire in preventing inductance, but also over 50 per cent smaller, roughly 30 per cent lighter and easier to apply.

"Metalshield," according to the company, is more effective than other shielding applications because of its ability to provide a solid wrap, directing all currents from the communication wire to drain wire soldered or bolted to the ground connection. Request NP1140.

•

MACHINE SCREW ANCHOR—The problem of keeping dirt out of machine screw anchor threads has been solved, Diamond Expansion Bolt Co. says, by its new machine screw anchor with a thin, tough, red fibre disc inserted in the bottom of their calking anchors.



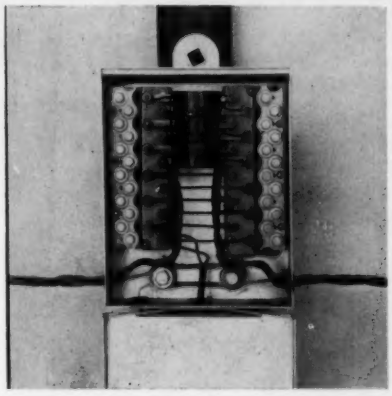
These discs are inserted at the factory. The red spot enables workmen to quickly identify the bottom end. This is said to eliminate insertion mistakes.

These "Red Seal" anchors are excellent for light loads, fragile masonry and light vibration conditions as well as electrical wiring installations, junction boxes, fuse and circuit-breaker panels, and conduit clamps in walls and floors, Diamond reports.

When machine screws are inserted full length, the thin red disc is pushed out. The anchors are installed quickly because only a shallow hole is required, according to the company.

The danger of cracking the surfaces of fragile walls is said to be avoided because the expansive pressure is regulated by the force of the blows applied to the calking tools and not by the bolt.

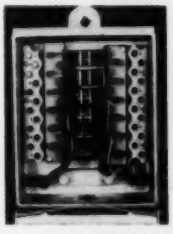
HERE IS OUR . . .
Type 177
TERMINAL LOADING CASE



for 6, 11, and 16 pair Rural Distribution Wire

Cast aluminum combination terminal box and housing for loading coils. Designed to be used for rural distribution wire for 6, 11 and 16 pair capacity and available in 8 types to meet your requirements. Terminals are available with or without protectors and designed to accommodate loading coils of 88 MH or 44 MH inductance.

Types 177A-177B

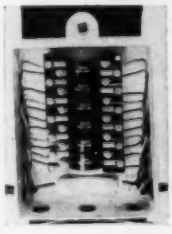


Contains two protected terminal strips complete with type 637A(88MH) or 637 B (44MH) coils.

Type 177F

Contains one protected terminal strip —no coils.

Types 177C-177D



Contains two non protected strips complete with type 637A(88MD) or 637B(44MH) coils.

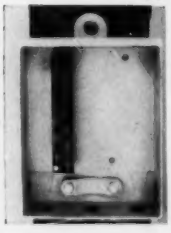
Type 177G

Contains two non protected strips — no coils.

Types 177E

Contains two protected terminal strips—no coils.

Type 177H



Contains one non protected strip—no coils.

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NORTH

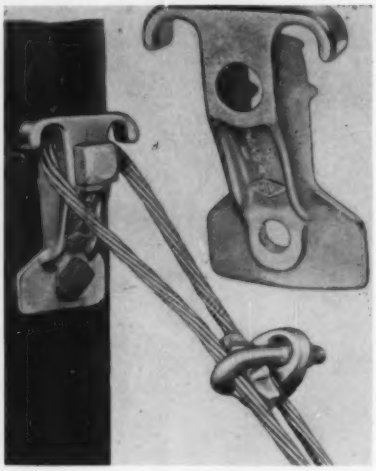
75TH
GREATEST YEAR

*another Telephone
Industry First

At present, this anchor is stocked in ¼ inch x 20 size. Other sizes are to be made available soon. Request NP-1141.

•

GUY HOOKS—An engineered design by which the through bolt is kept primarily in tension, rather than shear, thus increasing the load which can be carried for any given through bolt diameter, is the characteristic of the new improved MIF guy hook announced by the Malleable Iron Fittings Co., Pole Hardware Division.



This guy hook, the company states, will accept all types of guy dead-ending devices from 0 to 90 degrees permitting the use of one attachment for both down and span guys, thus simplifying inventories.

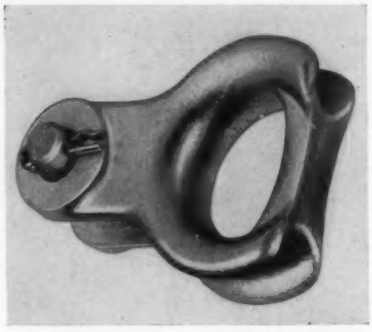
The made-up guy hook can be installed easily at any time during construction—either before or after pole is set. The channel shape of the back provides fitting to any pole diameter and the ears accept a wide range of strand diameters.

MIF guy hooks are of tough malleable iron, hot dip galvanized for greater corrosion resistance. Request NP1142.

•

THIMBLE CLEVIS—An economical method for dead-ending strand or cable messenger, is offered in a newly designed thimble clevis also announced by the Malleable Iron Fittings Co., Pole Hardware Division.

The company says the method of manufacture produces a smooth groove at no extra production cost, thus eliminating chafing of the soft strand.



The thimble diameter, of 2¼ inches maintains the shape of the strand, and the tie bar will accommodate a hook for stringing and tensioning operations. Strand diameters up to 7/8 inch can be used. Request NP1143.

•

TWO-WAY RADIO EQUIPMENT—General Electric Co. has announced an advance design of transistorized two-way radio equipment which it says contains the highest powered transistorized models, the smallest sizes, and the lowest battery drain.

The equipment has been designated as the General Electric Transistorized Progress Line. It will be available in units up to 75 watts, which the company claims, is the highest output achieved to date in transistorized communications.

From the 75-watt category, the new

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Special Purpose Tools To Specifications
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Over 500 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918

GMPCO

line ranges downward to 30 and 10 watt units in sizes as small as 8⅝ inches wide, 12 inches long, and 4 inches high.

The new line is said to contain very few tubes. Only three tubes are used in lower wattage categories and four in 30 and 75-watt models.

Lacy W. Goostree Jr., manager of marketing for the communication products department, said the new equipment has been designed, engineered and field-tested over a period of several years.

"General Electric's new line," he explained, "breaks the power barrier by going as high as 75 watts . . . Units with this much power offer more talk-back range for vehicles travelling great distances from their dispatch offices."

Mr. Goostree said General Electric's Transistorized Progress Line evolved from a need in the industry for technically-efficient transistorized equipment with reduced size, weight and power consumption but still capable of exceeding rigid military, municipal, industrial and business specifications.

A primary design consideration was lower standby drain, an important point for mobile radio users who find it necessary to hear their two-way radios when they are out of their vehicles.

When on "standby" (full sensitivity, ready to respond instantly to a call with full volume output), General Electric's new 75-watt unit is reported to use 0.040 amps. This is so low, the company points out, that a driver can leave his radio in the standby position continuously and the drain on the car's battery would be like the drain of the vehicle's clock.

Among engineering techniques which help conserve power is the elimination of power-wasting crystal ovens, the company said. These are designed out of the unit, saving more than 1½ amps with no loss in frequency stability.

A new circuit design is said to make possible 0.0005 per cent stability even though the crystal ovens are gone. Module heaters automatically come on when case temperatures drop below zero degrees centigrade and supply heat only when needed.

ENGINEERS

CIRCUIT LAYOUT & TRANSMISSION

FOR ITT SERVICE DIVISION'S WHITE ALICE LONG-LINES COMMUNICATION NETWORK PROJECT IN ALASKA

The White Alice project provides for operation and maintenance of 3,000 miles of line-of-sight and tropospheric scatter microwave radio circuits in Alaska. Supervisory engineering positions now open at the project headquarters at Anchorage offer excellent reward and interesting experience to competent engineers.

CIRCUIT LAYOUT—opening for BSEE or equivalent experience, plus six years communications engineering of which three years should have been as a circuit layout engineer.

TRANSMISSION ENGINEER—opening for BSEE or equivalent, with at least six years communications (voice and telegraph) experience, of which three years should have been as a transmission engineer.

To investigate these positions, write Mr. R. W. Broglie, Technical Placement, furnishing résumé of experience.

FEDERAL ELECTRIC CORPORATION

Service Division of International Telephone and Telegraph Corporation

Paramus Industrial Park, Paramus, New Jersey

EXTRA Holding Power
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TOUGH For long life

EVERSTICK
ANCHORS

For new construction and maintenance — Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resiliant, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

The receiver and power supply are completely transistorized and use no tubes. The receiver, according to reports, is designed so the final transistors in the speaker operate only when a signal is present.

Where tubes are used in the transmitter, longer life is said to be made possible through cooler operation. Shielded ventilation allows free passage of cooling air, yet circuit components are protected against moisture and dirt.

The smaller size fits better under the dash of a car and thus more leg room is gained, GE says.

In many vehicles, new mounting flexibility is achieved because the user has the option of placing the unit under the seat or in various other locations out of the way but still accessible. For this purpose, the equipment may be divided in two sections. The complete receiver and transistorized portion of the transmitter, oscillator, audio/modulator and first multipliers are all contained on printed circuitry in a frame which mounts in the front section and which contains all of the frequency-controlling elements. The back section contains the power amplifier, the transistorized power supply and aluminum heat sink.

The entire assembly is made of modules which plug into each other. This type of design is said to offer the advantage that complete power supplies, power amplifiers or any of the other modules can be carried as spares for quick field repairs. The effect of this approach is to make it possible for a single spare mobile radio unit to be used to service several units in the field instead of just one.

Preventative maintenance, according to GE, is made simple and fast with the new circuit design. Plug-in terminals on all cable connections speed installation and interchange of units. Cables are smaller and less bulky. To facilitate trouble-shooting, plug-in transistors are said to be easily removable, enabling the technician to make circuit tests which usually couldn't be made with transistors in place. All routine adjustments are accessible from the top of the unit.

Plated-through circuit printed boards are completely interchangeable on all units, according to the company. These are manufactured with flow-solder techniques, providing better quality and more uniform operation.

A heavy-duty circuit-breaker replaces fuses.

The finish is a pebble-grain, baked-on vinyl plastic that is claimed to resist chipping and marring. A new lightweight microphone, immune to ambient conditions, is provided.

The first units produced will be manufactured for use in 150-174 mc.

The company says units will be available in both narrow band, for new licensees, and wide band, for replacement use in existing communication systems where desired. The latter is engineered for conversion to narow band, with only six coil IF strips needing replacement when the user makes his decision to convert.

Phase-modulated transmitters are used in conjunction with compatible receivers and power supplies to provide two-way communications on narrow band and wide band assignments.

The equipment has provisions for either 12-volt or 24/12-volt power supplies. All units are said to be interchangeable for negative to positive ground. This is important particularly to large fleet users of two-way radio who may have an inter-mixture of vehicles of several manufacturers without common voltages or ground polarity.

Two-frequency operation is a standard option, providing one or two frequency transmit and/or receive. Request NP1144.

•

SHEATH BREAK DETECTOR — A new air-push leak detector which is said

TAKE A BIG STEP TOWARD SAFETY
WITH DUO-SAFETY LADDERS

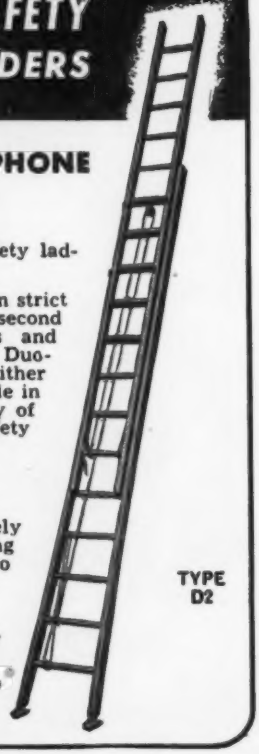
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

For Information, Contact Your Supply House, or

DUO-SAFETY LADDER CORP.
809 Ninth Street • Oshkosh, Wisconsin

to locate cable sheath openings in five seconds has been announced by Sprague Devices, Inc.

The company says sheath breaks in pressurized cables are easily located with this detector.

Sprague describes the detection procedure as follows: Wipe joint or suspect area with dauber. Watch for bubbles.

In just five seconds it will be known whether cables are losing pressure.

The air-push leak detector is reported convenient to use. It requires no mixing. It is applied as a clear, non-sudsing liquid and is available in a 4-ounce dauber-cap bottle as well as in pint bottles and gallon containers. Request NP1145.

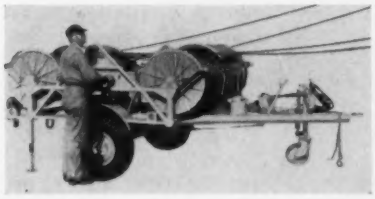
•

TENSIONING EQUIPMENT—Truck Equipment Co. has designed tensioning equipment which, it says, will simplify pulling conductors.

The new tensioning equipment consists of two pieces instead of the four said to be previously required to string conductors. The two pieces are called the "puller" and the "tensioner."

The puller is a multiple reel pulling trailer consisting of four reels, powered by a 30-hp air-cooled engine mounted on a trailer chassis.

The engine is described as operating through a four-speed forward, one-speed



Multiple reel pulling trailer ("puller").

when you come to
GRIPS
choose FANNER
Superformed*
FANNGRIPS*

For the GRIP — a (FF) FANNGRIP encircles a strand so tightly that it almost becomes a part of the strand.

Because the frictional force is greater than the strand strength, FANNGRIPS cannot slip!

For the SIMPLICITY — (FF) FANNGRIPS are easily and quickly applied by hand.

FANNGRIPS apply in a minimum of time without tools — eliminate laborous field fabrication.

For the COST — (FF) FANNGRIPS cost less, yet provide so much more than ordinary gripping methods.

No other dead-ending method matches the overall economy of FANNGRIPS.

Available for all galvanized steel, Copperweld and Aluminum Strands

FANNGRIPS FOR GUY STRANDS

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Fine Fanner Superformed Products

(FF) ARMOR RODS (FF) LINEGUARDS (FF) TAP ARMOR
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1904 AND 75TH AND GREATEST YEAR

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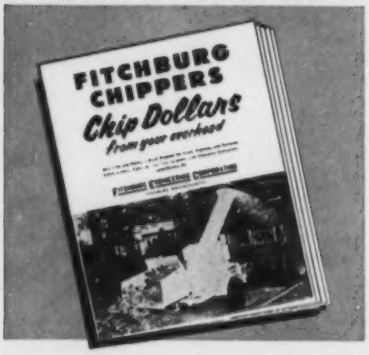
HOW TO SAVE MONEY IN BRUSH DISPOSAL



Read how foresters, tree surgeons, highway and park commissions, telephone, power and gas companies cut brush disposal costs up to 50% with a Fitchburg Chipper.

See cut-away color drawings of the Fitchburg Chipper—the exclusive Fitchburg spring-activated feed plate—pictures of different models in action.

FREE — Write for your copy of "Chip Dollars from Your Overhead." Address Dept. T-79.

FITCHBURG ENGINEERING CORPORATION

FITCHBURG, MASSACHUSETTS

Multiple reel stringing trailer ("tensioner").

reverse, hydraulic transmission with fluid coupling to furnish each of the four reels with 2000 pounds pull.

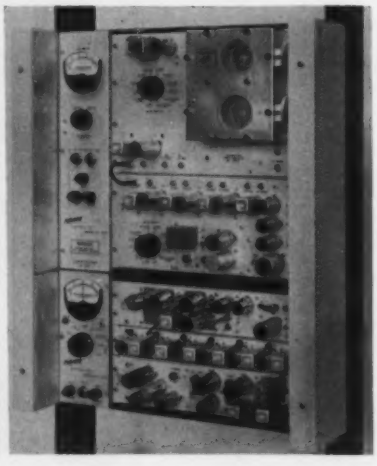
Each reel on the pulling trailer is equipped with 2,500 feet of rope. This, the company says, means that over ½ mile of four conductors can be pulled simultaneously.

The tensioner is a multiple reel stringing trailer that Truck Equipment Co. says will pay out four reels of conductor under 2000 pounds constant tension. These four reels are paid out simultaneously. Each of the four reels can be tensioned individually.

Operation of these two tensioning units is claimed to be relatively simple. The ropes from the pulling trailer are strung across line poles to span ½ mile. The ropes then are attached to the conductor. The brakes on the conductor reels are set at the proper tension, then the engine on the puller is started. Over ½ mile of conductor can be pulled in this manner in less than 60 minutes, the company reports. Request NP1146.

•

NEW ELECTRIC TYPE "PT" RADIO EQUIPMENT—A new approach to point-to-point radio service in several frequency bands in the region 50 to 2300 mcs is provided by the new Farinon Electric type "PT" radio equipment.



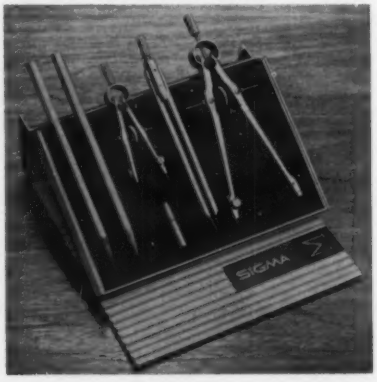
Using what the company calls a unique mechanical design, the equipment consists of a basic transmitter and receiver frames with numerous optional plug-in panels which are combined as needed to fit individual installation requirements.

For example, the equipment can be aranged for a single-section system of two or three telephone channels operating at 150 mcs, or for a multi-hop system with 24 telephone channels operating in the 2000 mcs point-to-point bands. The company states that the equipment provides wide flexibility in the selection of (1) operating frequency, (2) power output, (3) receiver sensitivity, (4) channel capacity, (5) frequency stability, (6) baseband output level and (7) baseband and service channel impedances.

FCC type acceptance has been obtained for the equipment, which is designed for mounting in standard 19-inch telephone-type racks or radio cabinets. Request NP1147.

•

DRAWING SET—The SIGMA Drawing Set featuring fingertip selection is now available from Eugene Dietzgen Co.



The case, Dietzgen says, is made of high-impact non-breakable plastic that withstands maximum abuse. It will not rust, warp or bind and may be washed to retain its new appearance the company says.

Flip-stand cover makes all instruments easily accessible.

The instruments, according to Dietzgen, were selected after extensive research. They are made of nickel-silver and steel, and are warranted for the lifetime of the purchaser. Request NP-1148.

•

EQUIPMENT FOR UNINTERRUPTED VOICE COMMUNICATIONS—Commswitch, an electronic "sentinel"

that assures uninterrupted voice communications essential to successful missile launchings was introduced recently by Kellogg Switchboard & Supply Company, a division of International Telephone & Telegraph Corp. Kellogg, which has charge of communications systems for the Atlas and Titan missiles, has already installed the Commswitches at Vandenberg Air Force Base in California, Kellogg officials stated.

The Commswitch (for Communication Failure Detecting and Switching Equipment) "listens" to a telephone

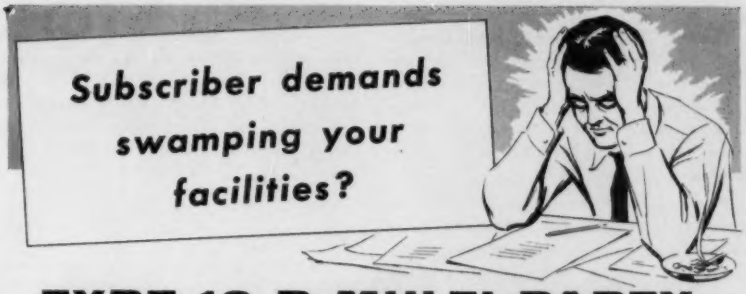
conversation, decides whether trouble along the line is making service unsatisfactory and, if so, instantly switches the call to an alternate line.

Additionally, the instrument prevents the injection of false information on the line, and even warns the operator of incipient trouble, engineers declared.

"The significance of the function of Commswitch," according to Maj. Walter D. Hale, communication officer of the Air Forces' Ballistic Missile Division, "is that it guarantees the fail-safe communication between important functionaries in the weapon system, thus precluding delays or failures in the capability of counting down and launching a ballistic missile."

Commswitch, a "black box" about the size of a two-drawer filing cabinet, operates by sending an analog voice sample with the voice signal, along a telephone line and "comparing" the two signals in a second Commswitch at the other end of the line being monitored. Differences in voltages between the compared signals indicate the existence and degree of trouble. Such trouble might be electrical "noise" which could drown out the signal; or changes in the transmission characteristics of the line or its associated equipment which might distort the signal, or even a broken line.

In its present design, Commswitch is for use with two high quality telephone



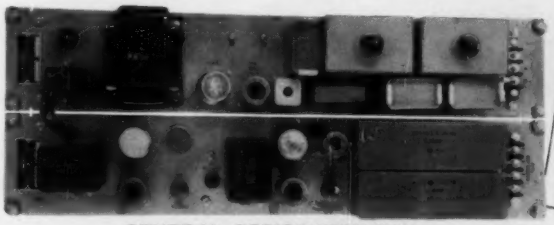
TYPE 16-B MULTI-PARTY
7-CHANNEL CARRIER
is your low-cost answer!

Budelman Type 16-B Carrier will:

- Provide additional circuits on existing party lines.
- Provide more-party service on new party lines.
- Better the service on existing party lines.
- Provide new circuits to new areas or subscribers beyond the 1200 ohm loop range.
- Free party line circuits for private line or pay station service.
- Provide additional trunks to remote PBX, PABX, or key telephone systems.

FULLY SELECTIVE 10-PARTY DIVIDED RINGING
SEMI-SELECTIVE 10-PARTY BRIDGED RINGING
SINGLE FREQUENCY CODED RINGING

All this without adding to your outside plant or disturbing existing services.



Fewer Vacuum Tubes, Simpler Circuitry than any other carrier system on the market

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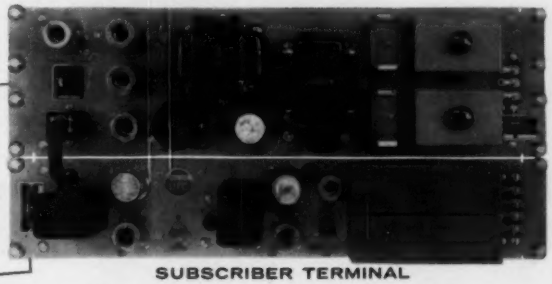

Crystal-Controlled Oscillators, Automatic Regulation — found only in systems costing much more.

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7 Channels — 10 to 140-kc frequency range. Applicable wherever attenuation at carrier frequencies does not exceed 35-db.

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BUCKEYE TELEPHONE & SUPPLY CO.

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lines, a primary and an alternate, and monitors two-way voice communication only. However, the device may be constructed to handle more than two lines and is applicable, with slight modification, to other types of signals sent over transmission lines, Kellogg engineers declared.

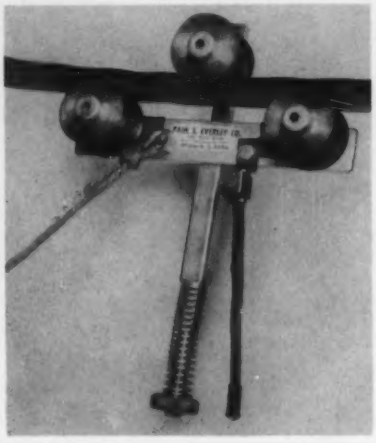
Possible future use would include transmissions for operating teletypewriter machines, stock tickers, telemetering signals for remotely controlling machinery used in oil fields, hydro-electrical plants and traffic control setups, and wherever it is mandatory to minimize any interruption of transmission. The equipment is designed to operate over cable or equivalent microwave circuits at distances up to 60 miles and is designed so that both ends of the landline or microwave circuit are switched simultaneously.

Although the Commswitch is being packaged for the Atlas project, it is not yet available for commercial use. Completely transistorized, it is designed to be mounted in a conventional electrical equipment rack. A lighted panel on the front of the device indicates whether the primary or secondary telephone line is in use, whether trouble exists in either of the two lines and whether the Commswitch itself is working properly.

In the event of trouble anywhere in the system, Kellogg states an audio alarm is sounded and red lights indicate where the trouble exists. If trouble strikes both lines, the Commswitch can tell which line is least affected so as to choose that line. Request NP1149.

•

EVER-GROUND—A new device, called the "Ever-Ground", is said by the Paul S. Everly Co. to provide constant grounding of moving conductors, either wire or messenger strand, as they are pulled in on a wire-stringing job. This device will provide adequate protection to linemen, the company says, against accidental energizing of conductors.

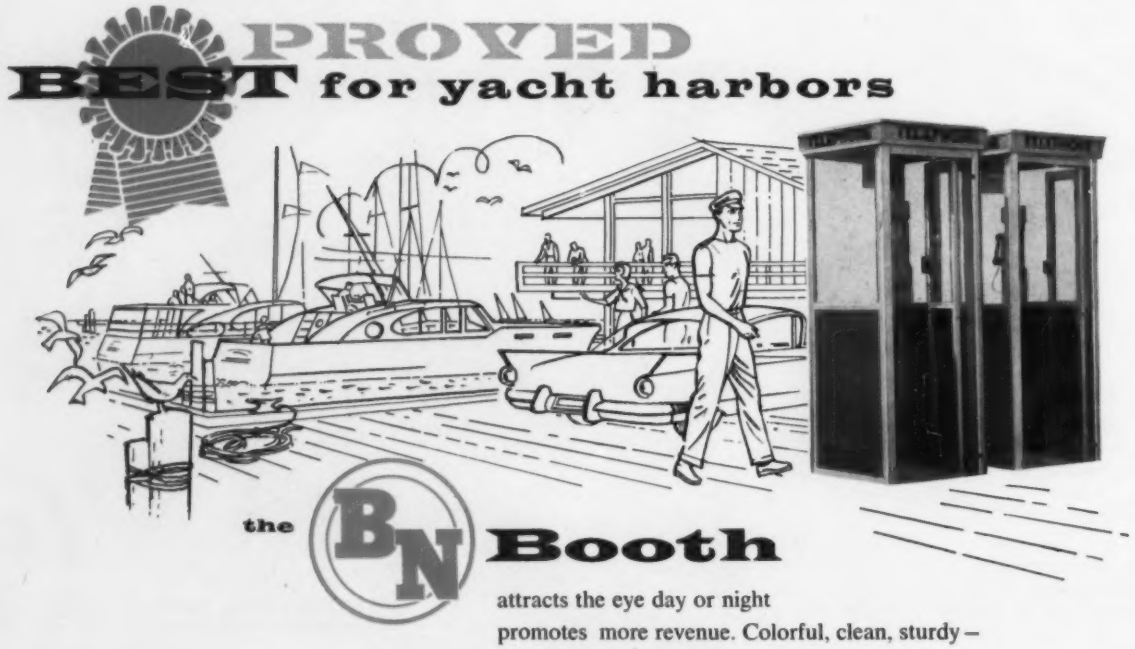


The "Ever-ground", according to the company, is easy to install. It snaps on the line at any point without a threading-through operation. It can be secured at the reel or the crossarm by a rope line and will float on the conductor and keep it grounded.

It will accommodate conductors from 1/16 inch to 1½ inch in diameter. The rollers on this grounding device are high contact metal with Oilite bearings, which need no oiling.

The large coil spring maintains the rollers in firm pressure contact with the moving conductor. It also permits the passage of splices.

The "Ever-Ground" has been tested on 6900 volts, with a fault current of 3300 amperes to ground for 9 cycles. There was no voltage drop across the device, indicating that there was good, even contact at all times, the company states. There was no arcing, pitting, or burning at the point where the rollers contacted the conductor. Request NP 1150.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a B-N booth is a busy booth!

SEALED RATCHET LEVER HOIST—The new Coffing sealed ratchet lever hoist is equipped with a sealed brake chamber.

The Coffing Hoist division of Duff-Norton Co. offers five models in the new MA series Coffing sealed ratchet lever hoist line.

Ranging from ¾ ton to 6 ton capacities, the light-weight hoist features a brake chamber neoprene-sealed in five places against water, oil, chemicals and dirt. This provides safe, dependable hoisting power under exposure conditions, the company says.

Overload protection is in the safety handle which bends to indicate an over-capacity load before the chain breaks or hooks open. Another safety feature is the protected location of the free chain control to prevent accidental tripping. According to the company, the hoist will not free the chain when loaded.

The high strength and lightweight aluminum alloy frame is said to make for easy transportation. Precision load spotting within fractions of an inch can be accomplished. The up and down control is placed high on the handle. It will not interfere with the operator's hand when he uses shorter leverage for greater lifting speeds.

Another feature described by Coffing is the load hook supported on ball bearings that swivel for easier load handling. The load chain is of welded alloy steel, heat treated and plated for maximum wear.

Available models include ¾ ton, 1½ ton, 4½ ton to 6 ton capacities. Request NP1151.

The Balance

"One-half of the world must sweat and groan that the other half may dream."—LONGFELLOW.

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Whitney Blake TELECABLE for Direct Burial, is made to last, to withstand the most "unfriendly" soil conditions and to give long, uninterrupted service underground.

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Bean Returns from BDSA; Heads AE Defense Projects

Richard B. Bean has been appointed director, special defense projects, Automatic Electric Co., Northlake, Ill.

Mr. Bean will act as coordinator of those defense projects that require special planning, development and production, working in close association with the government sales division of Automatic Electric Sales Corp. and other subsidiaries of General Telephone & Electronics Corp.

R. B. BEAN

Formerly manager, administrative services for Automatic Electric Co., Mr. Bean has just returned from six months temporary duty in Washington, D. C., as assistant director, communications industries division, Business & Defense Services Administration.

Executives Marx, Beggs Elected by ITT Board

Election of two executives by the board of directors of International Telephone & Telegraph Corp. was announced on July 9 by H. S. Geneen, president.

William T. Marx has been named senior vice president, planning and organization and industrial relations; and Harry G. Beggs, vice president, manufacturing and facilities.

Mr. Marx joins ITT from the Raytheon Co., where he had been director, organization planning and employe relations, since October, 1957.

Before that he was associated with the Celanese Corp. from 1934 to 1957.

In 1945 he was appointed personnel manager at New York headquarters and in 1953 was named assistant to the vice president for organization planning. He became director of personnel administration in 1954.

Mr. Marx was an officer of the

W. T. MARX

United States Army Air Force during World War II, serving from 1942 until his discharge in 1945.

A native of New York City, he attended The City College (CCNY), Pace College and Columbia University, all of New York.

H. C. BEGGS

Mr. Beggs goes to ITT from the management consultant firm of Cresap, McCormick and Paget, New York, where he had been a partner since 1952.

Previously, Mr. Beggs had been president of the B-H Co., Inc., Cambridge City, Ind., metal fabricators; vice president and general manager of National Automatic Tool Co., Inc., Richmond, Ind.; and a partner in the management consultant firm of Stevenson, Jordan & Harrison, New York.

A native of Brooklyn, N. Y., Mr. Beggs was graduated from Sheffield Scientific School, Yale University, with a bachelor of science degree in civil engineering.

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1 • Our new ACCO *ALUMINIZED* Telephone Wire, combining the strength of steel with the corrosion-resistance of a bonded coating of aluminum. Available in these grades: Best Best (BB); Grade 85; Grade 135; Grade 190 (Support Wire) and Steel Construction Wire.

2 • Our new ACCO *ALUMINIZED* Steel Strand, also with a bonded coating of corrosion-resisting aluminum. Made in 3-, 7- and 19-wire construction. Available in Common, Siemens-Martin, High Strength, Extra High Strength and Utility grades.

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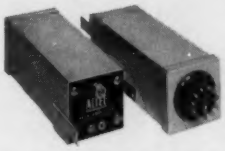


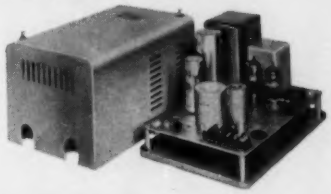
447A TRANSISTOR AMPLIFIER
Telephone Repeater Type

Directly interchangeable with vacuum tube repeaters; dimensions are identical. Requires only 24-48 volts. Eliminates need for 130v supply.

SPECIFICATIONS:
Type: Repeater Amplifier (transistorized) • Gain: 37 db from and into 600 ohm loads • Power Output: +18 dbm (at +10 dbm distortion is 1.5%, 300-3000 cps) • Frequency Response: −1 db at 200 and 5000 cps referred to 1000 cps • Input Impedance: 600 ohms • Output Impedance: 600 ohms • Output Noise Level: −70 dbm • Controls: Input volume control which varies gain from −2 db to maximum gain • Power Required: 17-24 v (50 ma @ 20 volts) • Transistors: 1—2N191, 1—2N188A • Dimensions: 1¾" x 1¾" x 6" • Color: Cadmium plate with dichromate finish • Weight: 14 oz. • Mounting: 11 pin Amphenol 86 CPN plug • Monitor Tap: Auxiliary output winding 11 db below 600 ohm winding available at test jacks on front panel and at connector pins at rear of unit • Accessories: Panel for rack mounting 10 repeaters; Rack mounting power supply capable of energizing 100 repeaters; Equalizer; Panel for mounting up to 10 equalizers; Assembly for mounting a 447A in 105B apparatus box.

444B AMPLIFIER
COMPRESSION TYPE

Compression, attack and recovery times are fixed quantities providing optimum performance for message use.



SPECIFICATIONS:
Type: Compressor Amplifier • Gain: 600 ohm input: 70 db • Bridging input: 57 db bridging 600 ohm line • Maximum Compression: 35 db change in input results in 15 db change in output • Power Output: 34 dbm at 30 db compression; 35 dbm with rectifier tube removed • Frequency Response: −2 db at 100 and 3000 cps relative to 1000 cps; More than 10 db down at 10,000 cps • Input Impedance: 600 ohms balanced and 12,000 ohms balanced for bridging • Source Impedance: 600 ohms • Load Impedance: 4 and 600 ohms • Noise Level: 80 db below rated output; −115 dbm equivalent input noise • Power Supply: 117 volts, 60 cps, 30 watts • Tubes: 1—6BC8, 1—6AL5, 2—12BY7A • Dimensions: 9" x 6" x 5" • Weight: 7½ lbs. • Attack Time: 50 milliseconds • Recovery Time: 1 second for 63% recovery • Harmonic Distortion: At 33 dbm output, less than 5%, 200-4000 cps; At 30 dbm output, less than 2%, 200-4000 cps.

S-17B PROGRAM
AMPLIFIER SYSTEM

Cabinet houses two program-quality 437B amplifiers capable of multiple tandem operation, two 17224 equalizers, and two jack fields to facilitate testing, equalizing, and monitoring. Each amplifier contains its own AC power supply and mounts in the cabinet independently on a plug-in basis for easy replacement and centralized maintenance.

SPECIFICATIONS:
Output Power: +24 dbm • Distortion: not over ½% THD (30-15,000 CPS at +24 dbm) • Gain: at least 44 db; adjustable to minimum of 8 db • Gain adjustment: 2 db steps and 1½ db vernier • Frequency response: ±1 db, 20-20,000 cps • Equiv. input noise: −115 dbm • Input impedance (internal): 150/600 ohms ±5% • Output impedance (internal): 150/600 ohms ±5% as measured at output of the bridge • Longitudinal balance of input circuit and output circuit with 600 ohm connection: 55 to 60 db at 40 and 15,000 cps; 70 db at 1000 cps • Tubes: 1—12AY7, 2—12BY7A • Electrolytic condensers: Sprague 17D or equivalent • Transformer insulation: 1500 volt insulation between primary and secondary windings • Impendance change simply accomplished by reversing the impedance plug. Occupies 9⅜" of 19" rack space.

For complete information about ALTEC telephone and paging equipment see your Yellow Pages or write to

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IMPACT OF TELEPHONE COMMUNICATIONS

Concluded from page 28

appears, on a trend, to be overtaking (b). A graph for 1960, based on 1900-1956 experience, would be meaningless unless automation and plant equipment were taken into account. (Note: Trends will be taken into account when current statistics become available. Trends, based on the 1900-1956 experience, would be misleading.)

In 1958 there were 1,140.9 thousand telephones, with 316.7 for business and 824.2 for residence use. The personal income in 1957 was 6,352 million dollars.

Employment presented, on a percentage basis, the pattern shown below:

Type of Employment	*Percentage Distribution*
Total employment	100.0
Mining	*
Contract construction	5.8
Manufacturing	47.2
Transportation and other public utilities	5.0
Trade	17.1
Finance, insurance and real estate	5.3
Service and misc.	9.9
Government (**)	9.7

* None or less than 0.1, or combined elsewhere.
** Lowest in the region.

(To be continued)

Answers to Questions On Page 55

(1) If no acceptable report has been given at the end of this period, and the search is to continue, the information operator should say, for example, "I'm sorry to keep you waiting. If you'll give me your number, I'll call you." Then she should proceed in accordance with the subscriber's reply, making a memorandum of the details if the search is to continue.

(2) Do not give out any information to the customer, or answer any inquiries by him, of this nature.

(3) Repeat the report a second or third time, modifying the wording if possible, in order to make it clearer. If you are still unable to make the report understood, refer the case to the supervisor.

(4) The information operator should not do so.

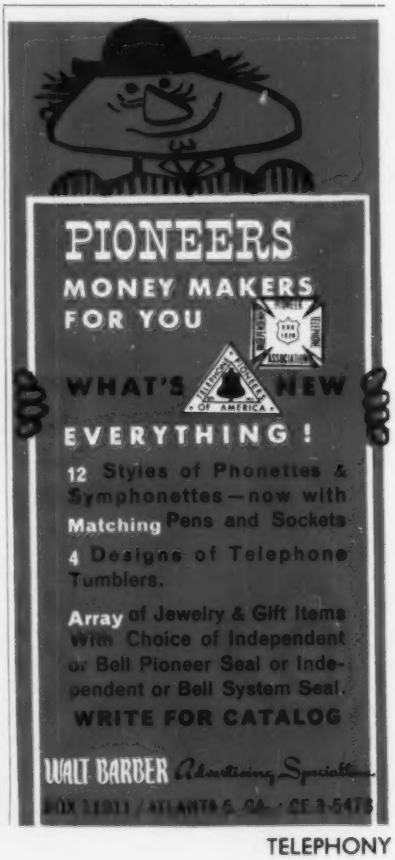
(5) The information operator should say, for example, "I'm sorry, I cannot connect you" and add, "Will you hang up for a moment, please, and then make your call?" or, "Will you signal the operator please, and ask her for the number?" as required.

Cheney Heads Operations, Finley Engineering in Ill.

Don Cheney, formerly with Reliable Electric Co., has announced his association with the Finley Engineering Co. of Lamar, Mo.

Mr. Cheney graduated from the University of Wisconsin with a B.S. degree in electrical engineering, and has worked for the Wisconsin Telephone Co., the General Telephone Co. of Wisconsin, and for the Gustav Hirsch Organization.

He will be in charge of the operations of the company in Illinois. An office will be opened in central Illinois in the near future.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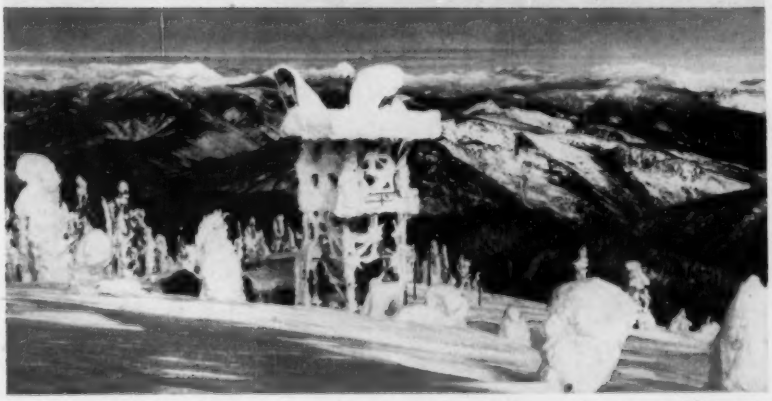
Path followed by 6,000-megacycle radio beam from Greenstone Mountain to Kamloops, B. C., with the passive reflector on Mt. Paul bouncing the signal direct to the telephone building.

B. C. Independent Employs Microwave Bounce System

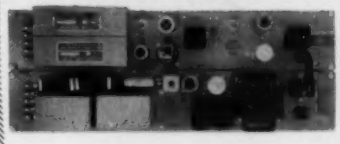
Telephone subscribers in Kamloops, B. C., are now receiving their nationwide toll telephone calls by a unique microwave "bounce service" provided by British Columbia Telephone Co. (photo above).

Long distance calls destined for Kamloops arrive from a repeater on Greenstone Mountain (located off the picture to the right) via the path indicated by the broken line. Signals from Greenstone strike a passive reflector, at left, and are bounced one-and-one-half miles to a receiving antenna erected beside the Kamloops telephone building.



British Columbia Telephone Co. microwave relay station on Thompson Mountain near Creston, B. C. Top photo shows the site in September; lower picture was taken in February.

MULTI-PARTY SUBSCRIBER CARRIER TELEPHONE EQUIPMENT



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The reflector — a 20 x 24-foot billboard structure of aluminum—is the first of its type to be designed and manufactured in British Columbia.

The new route to Kamloops is part of the company's Lenkurt 74A microwave system which was engineered and supplied through Automatic Electric International. The 290-mile-long system —carrying 128 channels—consists of two terminals and eight 6000-megacycle repeaters which are located in the mountainous terrain between Kamloops and Vancouver. Featuring greatly increased circuit facilities, the microwave chain is presently expandable to 216 channels, with an ultimate capacity of 240.

Sixteen feet of snow provides an interesting contrast for the two photographs (below) taken at the same site, but it doesn't hamper the operation of British Columbia Telephone Co.'s microwave relay station located atop the windy slopes of Thompson Mountain near Creston, B. C.

The station—perched at an altitude of 6900 feet—is part of the Trans-Canada microwave system which spans the Canadian provinces from the Atlantic to Pacific. While the total ultimate capacity of the system is 12 one-way channels, the basic complement is six channels—three in each direction—with two of these channels used for standby purposes or special occasions. A pair of channels can carry up to 600 telephone conversations, or alternatively, one television program.

Lincoln on Property

"Property is the fruit of labor; property is desirable; is a positive good in the world. That some should be rich shows that others may become rich, and hence is just encouragement to industry and enterprise. Let not him who is houseless pull down the house of another, but let him work diligently and build one for himself, thus by example assuring that his own shall be safe from violence when built."—ABRAHAM LINCOLN, *March 2, 1864.*

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Submit detailed résumé, photograph, references and definite basic salary requirements. Off-Continent allowances, privileges and compensation adjustments will be provided after evaluation of résumé, which will be treated in confidence. Address Replies Air Mail to: Chief, Telecommunications Div., Television Associates of Indiana, Inc., East Barker Ave., Lakeland, Michigan City, Ind.

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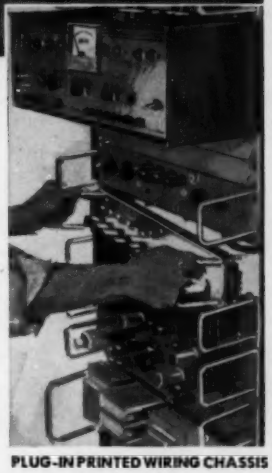

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